News By Teletype From 4 News Bureaus

National Petroleum News

News From Oil Industry Everywhere

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Gains In Gasoline, Heating Oil Seen For Fall

Private Truck Faces Control By Government

ATLANTIC CITY, N. J., Sept. 17. — All privately-operated trucks, especially tank trucks, are on the brink of government regulation but business in general is asleep to the danger threatening this important adjunct of its operation.

Such was the warning delivered by J. F. Winchester (Standard of New Jersey), chairman of the American Petroleum Institute's automotive committee, at the convention here of the National Petroleum Assn.

Winchester's conclusion that privately-operated trucks—such as the delivery trucks of the department store or a local oil company—face regulation, was based on his years of experience, including his work under the trucking code during the NRA.

His paper was prepared prior to the Interstate Commerce Commission's announcement, earlier in the week, that hearings would begin in October (See N. P. N., Sept. 14) on safety regulations for contract and common carriers hauling "dangerous" articles on the highways in interstate commerce and also on the question of *applying these safety regulations to private carriers.* But the ICC announcement only emphasized his point.

'Entering Wedge'

In the round-table discussion which punctuated Winchester's points, the opinion was expressed that the ICC hearing on application of the proposed safety regulations to private carriers was the "entering wedge" for further regulation of all motor equipment operated by private business as an adjunct of its main activities — an eventuality which many attending the N. P. A. transportation conference seemed convinced was imminent, unless forestalled by

(*Continued on page* 12)

The continued steady growth in demand for the oil industry's principal product, motor fuel, during the current and preceding years, in relation to indices which show activity in other industries, is graphically shown on the cover of this N.P.N.

1938 Gasoline Tax Collections Up 2%

By Teletype

WASHINGTON, Sept. 20. — Federal gasoline tax collections for August showed an increase of almost $6,000,000 over August collections the year before, the Bureau of Internal Revenue reports. Collections this year were $19,369,069, as compared with $13,721,866 for August, 1937.

Federal revenue from the gasoline tax for the first eight months of 1938 was $126,285,767, an increase of more than 2.3 per cent from the $123,342,192 collected in the same months of 1937.

Still Further Gains for Oil Hinge On An Upturn For General Business

CLEVELAND, Sept. 20.—With no noticeable upturn in general business activity in the last quarter of this year and the first quarter of 1939, the oil industry has in prospect a gasoline demand a little better than in the same period a year ago, an improved kerosine demand and a materially better demand for heating oils.

With an upturn in general business, consumption of these products will be stimulated and there will also be an improved market, as compared with last year, for heavy fuel oils, which are now the drag on refiners' operations.

These are the conclusions of various authorities in the oil industry, whom NATIONAL PETROLEUM NEWS recently queried for their ideas on the prospects for the oil industry in the coming fall and winter months. Their estimates are given in detail in accompanying articles in this issue.

When 1938 operations of the oil industry can be looked at in retrospect, one important fact will be the industry's success at liquidating its inventories, aside from heavy fuels.

Crude oil stocks have been cut by 17,420,000 barrels from the first of the year to 288,664,000 barrels July 31, as against 308,000,000 barrels for the same date in 1937.

Current production has suffered as stocks were drawn upon and this will likely continue, with further cuts in allowables in the southwest, it is believed.

Critical point in the producing fields is California, where it is estimated 50,000 barrels daily must be cut by voluntary proration efforts, from the present daily average output of 615,000 barrels, if stability is to be maintained. New flush fields complicate the picture there.

Total gasoline consumption for 1938 is estimated by NATIONAL PETROLEUM NEWS at 514,286,000 barrels as compared with 503,481,000 barrels in 1937 — a small gain but nevertheless a gain in a year of general business decline.

Gasoline Stocks Drop

Gasoline stocks on Sept. 17 stood at a little over 69,000,000 barrels, according to the latest American Petroleum Institute figures, nearly down to the comparable 1937 figure of around 66,000,000 barrels, while they were relatively much higher in the early months of the year.

Heavy fuel oils were the product on which the oil companies stubbed their toes this year. Production for the first seven months was 2.59 per cent less than for the same period in 1937; but domestic demand was 14.86 per cent less and stocks on July 31 had climbed to over 99,000,000 barrels, as compared with around 80,000,000 barrels to start the year.

See pages 16-19.

HIGHLIGHTS OF THE NEWS

Tax Receipts Up

WASHINGTON — Federal gasoline tax collections for the first eight months of 1938 were 2.3 per cent ahead of last year, due to a big jump in August. Page 9.

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October Demand Up

WASHINGTON — October gasoline demand will top last year by one per cent, the Bureau of Mines forecasts. Page 22.

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'Gas' Stocks Down

NEW YORK—U. S. gasoline stocks dropped 1,616,000 barrels last week, the A.P.I. reports. Page 23.

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Gasoline Grading

DETROIT—Gasoline grading proposed as next stabilization move. Page 10.

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Price Posting

TRENTON—First case under New Jersey price-posting law brings $50 fine for gasoline retailer. Page 11.

Price Law Test

NEW YORK—Contracts specifying minimum retail prices on branded gasolines under state fair trade law face court test. Page 20.

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'Not Hostile'

ATLANTIC CITY—"Not hostile to business," Sen. O'Mahoney tells National Petroleum Assn.'s annual meeting. Page 12.

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Pipeline Rate Cut

TULSA — Pipeline rate cuts on Oklahoma crude have been proposed to meet competition from northern fields. Page 10.

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Cut-Price Crude

TULSA—At least 18,000 barrels daily of Oklahoma and Kansas is being bought at less than posted prices. Page 20.

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Texas Indictments

TULSA—Renne Allred, Texas governor's brother, and others indicted on charges of violating Connally Law. Page 11.

Pipeline Rate Cut On Oklahoma Crude

TULSA, Sept. 17. — Application of the Oklahoma Pipe Line Co. and connecting carriers for substantial reductions in pipeline tariffs on crude oil from Oklahoma are looked upon by the trade here as a partial equalization with rates from Illinois fields to refineries in Ohio and West Virginia.

The new rates sought in schedules filed with the Interstate Commerce Commission Sept. 15 are to become effective, if approved, Oct. 15. Except for a readjustment in tariffs from West Texas about a year ago, this would be the first substantial cut in pipeline rates in about three years.

Oklahoma Pipe Line Co., subsidiary of the Standard Oil Co. of New Jersey, moves only Oklahoma crude. It delivers oil at Glenpool, Okla., near Tulsa to the Ajax Pipe Line Co., in which the New Jersey company holds dominating interest and in which Pure Oil Co., Standard Oil Co. of Ohio hold substantial interests. The Ajax is a carrier only, operating no gathering lines. Its line ends at Wood River, Ill., where the crude is taken by Illinois Pipe Line Co. for movement to other connecting carriers that deliver to various refining points.

The Oklahoma Pipe Line Co. moves oil southeast to DeQueen, Ark., where connection is made with Standard of Louisiana line for deliveries at Baton Rouge, La.

New Rates Proposed

New proposed tariffs, in cents per barrel, obtained by the Washington bureau of National Petroleum News from the I. C. C., with existing tariffs which are still in effect, are as follows:

Delivery point	Proposed Rate	Present Rate
Springfield, Mo.	15	none
Anchorage, La.	25	33
West Virginia points	46	57
Heath, O.	45	55.5
Cleveland, O.	45	55
Bayshore (Toledo), O.	40	52.25
Lima, O.	37.5	51
Latonia, Ky.	38	51
International Boundary	45	55

No statement has been made by the pipeline company and the reasons for the change are matters of conjecture. The proposed tariff to Springfield, Mo., is a subject of speculation as no deliveries of crude have been made to that point. There is no refinery there.

Anchorage, La., is the delivery point near the Baton Rouge refinery of the Standard Oil Co. of Louisiana. West Virginia points include Cabin Creek, where Pure Oil Co. has a refinery, and Parkersburg, location of a Standard of New Jersey plant. Pure has a refinery at Heath, O., and the Standard Oil Co. of Ohio has refineries at Cleveland, Toledo, Lima and at Latonia, Ky. International Boundary is the delivery point for crude going to the Sarnia, Ont., refinery of Imperial Oil, Ltd.

Michigan Talks Of Law Defining 'Gas' Standards

LANSING, Mich., Sept. 19.— Michigan's fair trade law designed to bring about retail gasoline price stabilization and minimize price wars, may have a running mate in the form of a law setting minimum requirements for the various grades of gasoline in the state.

Such a law was advocated here last week by John B. Strange, state agriculture commissioner, who said this measure would serve to protect motorists from inferior grades of gasoline, particularly during price wars.

Commissioner Strange said the proposal had grown out of numerous requests, mainly from filling station operators, who had complained about the quality of gasoline sold by their competitors.

Could Confiscate

The state now has authority only to test gasoline storage tanks for capacity. If such a law is passed, it would enable the state to confiscate inferior or adulterated gasoline under the terms of Michigan's strong Fraud and Deception Act, officials said.

Further indication of the way the state is thinking in the matter of minimum standard regulation of gasoline is shown in the following excerpt from an address given by Leo V. Card, director of the state's bureau of foods and standards, before the state weights and measures conference early this month:

"You can look about you today and see the oil and gas wars in each direction. What are we going to do about this? Are you sure that all of the gas offered to the public today is of the same quality? How long is the public going to sit idly by and get good gas at five for a dollar and in the next station get poor gas at five for a dollar, or whatever the price may be?

"Are we going to do anything to protect the one who buys this gas? I think we are doing far too little myself. The final outcome of some of these gas wars some day will be that we will be assured that we are getting the grade of gas we pay for. We will do this by the state doing the testing of all of this commodity for uniformity."

Cost Survey Approved

In the meantime, Detroit and Wayne County dealers have voted on and unanimously approved a new dealer operating cost survey recently completed by Prof. Herbert F. Taggert of the University of Michigan. This survey, which is to be used as a basis for prosecutions under the "sale below cost" section of the Michigan Fair Trade Act, shows an average operating cost of 4.8 cents per gallon in Detroit, and 4.6 cents per gallon in the county.

Pipeline Complaint Docketed

WASHINGTON, Sept. 19. — Complaint of Petroleum Rail Shippers' Assn., composed of Mid-Continent independent refiners, asking that "excessive" rates of pipelines and railroads be investigated, has been docketed by the Interstate Commerce Commission and given the number 28106. (For details of complaint, see N.P.N., Aug. 24).

Louisiana Standard Complains To ICC On East-West Rate

N. P. N. News Bureau

WASHINGTON, Sept. 19. — Naming practically every railroad in the South, Middle West, Northwest and Rocky Mountain states as defendants, Standard Oil Company of Louisiana has filed a complaint with Interstate Commerce Commission seeking lower rates for its products from North Baton Rouge, La., to points in Wyoming, Colorado, South Dakota, Nebraska, Kansas and Oklahoma.

No specific rates are cited in the complaint, which has been docked under the number 28105, but the broad charge is that the railroads are charging rates on the oil products going from North Baton Rouge to the states named which "do not bear a just relationship to rates they maintain from other shipping points in Arkansas, Louisiana, Oklahoma and Texas."

ICC has taken no action on the complaint as yet.

C. F. R. To Try Cetane Testing Of Diesel Fuel

N. P. N. News Bureau

NEW YORK, Sept. 16 — The new method for determining ignition quality of diesel fuels, the Cetane Number Method, as developed by the automotive diesel fuels division, has been adopted by the Co-operative Fuel Research Committee as the method on which further investigation will be concentrated by that body, in a meeting held here today.

This method has been under development for some years by a volunteer group, under the leadership of T. B. Rendel, Shell Petroleum Corp., which group some time ago was taken up by CFR as its Automotive Diesel Fuels Division.

The method is being released by the CFR to the American Society for Testing Materials and to trade journals for publication *for information only* as a proposed CFR test method. It is understood that new test fuel samples will be distributed to the different co-operating laboratories and the work of further perfecting the method will be continued by the division.

A dozen meetings of the different groups and divisions of the Co-operative Fuel Research Committee were held Sept. 13-16, during which reports of progress were made, and plans for the continuation of the various problems were worked out. The work of the CFR is fast becoming more voluminous, with an increasing number of subcommittees and divisions to carry on the research problems of the oil and automotive industries in its field.

These divisional and group meetings included those on surveys of aviation and foreign motor fuels, laboratory and road test programs on motor fuels, aviation and diesel fuels, vapor lock problems, full scale and laboratory detonation tests on aviation fuels and on the gasoline tank corrosion program for aviation fuels. The stages of development of these programs, as reached in these meetings, have not been announced by the committee.

Valvoline Hearing

WASHINGTON, Sept. 19. — A hearing will be held in federal court at Pittsburgh Sept. 29 on Valvoline Oil Co.'s suit attacking Interstate Commerce Commission pipeline valuation orders.

Connally Law Charges Name Renne Allred

N. P. N. News Bureau

TULSA, Sept. 17. — Indictments were returned by federal grand jury in Houston today against Renne Allred, Neal Powers and H. E. Hines, charging violation of the Connally Act which prohibits movement of oil produced in violation of valid state orders in interstate commerce.

Renne Allred, attorney, lives in Dallas. He was one time district judge of Gregg county. He is a brother of Gov. James V. Allred, Texas, who recently was named by President Roosevelt to be federal judge in the southern district of Texas. Neal Powers, Tyler attorney, formerly was assistant attorney general of Texas when James V. Allred was attorney general. Hines is described in the indictment as being of Kentucky. He was also indicted, according to Assistant Attorney General William W. Barron, in 1937, on conspiracy charges in connection with alleged "hot" oil practices but has never been arrested.

Cash bond of $2500 was posted for Neal Powers the night of Sept. 17 with U. S. Commissioner W. F. Carothers. Attorneys for Renne Allred in Dallas said that similar bond, set by the court, would be posted with the commissioner in Dallas as soon as the necessary papers arrived from Houston.

Was Texas Judge

Renne Allred, who as district judge in Gregg county presided in numerous "hot" oil trials, formed a law partnership with his brother, Raymond, and Neal Powers in 1935. The firm maintained offices in Tyler and had numerous oil cases in federal and state courts. Powers, while assistant attorney general, was assigned regularly to the prosecution of cases involving violation of Railroad Commission regulations in the East Texas field.

The present indictments are an aftermath of the one returned by federal grand jury on April 13, 1937, at Houston, charging conspiracy to violate the Connally act. The offenses are alleged to have occurred in the Conroe field, Montgomery county, Texas. In the former indictment the grand jury named Otis H. Gibson, Oren C. Roberts, D. D. Feldman, A. N. Adelson, H. E. Hines, L. R. Hepworth, M. D. Carter, Frank M. Bennett, George Arnold, Jr., Shuford Farmer, Adel Oil Co., Higrade Oil Co., Crescent Oil & Transport Co., Gulf Oil Marketing Co., Adeltex, and Channel Transport & Marketing Co.

One of these, M. D. Carter, a former employe of the railroad commission, was also prosecuted in state court and was sentenced to prison. He is at present under bond awaiting action of the appellate court. The other cases under the old indictment were disposed of chiefly through pleas of guilty and *nolo contendere*, fines being imposed by the court.

The indictment against Allred, Powers and Hines, like that of April, 1937, alleges that oil was moved from the Conroe field in interstate commerce, via pipelines and tankers. As in the former case, nine counts are asserted, involving an average of about 107,000 barrels on each count. The April, 1937 indictment placed the period of the alleged violation as Sept. 4, 1935 to March 15, 1937.

The federal court district in which Allred, Powers and Hines were indicted is the same in which Gov. Allred is to sit as judge when he assumes the position to which President Roosevelt appointed him this summer. He has indicated recently that he may resign as governor before his term expires next January and enter upon his new duties without waiting for Senate confirmation.

Atlantic Checking On Fitts

N. P. N. News Bureau

TULSA, Sept. 19.—Producing properties of E. H. Moore, Inc. in the Fitts pool of Pontotoc county, Oklahoma, are being checked by the Atlantic Refining Co., according to reports here. The properties have a daily allowable production of 12,300 barrels, with 192 producing wells.

Fined $50 For Discounting In New Jersey

TRENTON, N. J., Sept. 19. —In the first action under the New Jersey laws regulating gasoline retailing, Hyman Namarovsky, operating as the Cross Town Garage of Newark, was found guilty last week of selling gasoline below his posted price and fined $50 by Judge Anthony P. Bianco, in the Third Criminal Court of Newark, according to Joseph L. McLaughlin, director of the state's division of motor fuels, which has been policing the New Jersey fair trade and price posting law. Several other similar cases are on the fire, but none actually scheduled, it was said.

Texas Fields to be Closed On Eight Days In October

By Teletype
N. P. N. News Bureau

TULSA, Sept. 20.—Texas fields will be shut in four Saturdays and four Sundays in October but the holidays will not include the final Saturday and Sunday of that month, the Railroad Commission of Texas ordered late Sept. 19, following the monthly statewide hearing on proration and conservation.

Estimated net production for October, taking into account the eight shutdown days, according to the commission's calculations is 1,275,122 barrels daily, which is 83,878 barrels per day less than the U. S. Bureau of Mines forecast of 1,359,000 barrels of demand for Texas crude. For the first 17 days of September the allowable, deducting the Saturday and Sunday closings, averaged 1,240,953 barrels but actual production has been less than that figure.

Chairman Clyde V. Terrell, defeated for nomination in the recent run-off primary by G. A. Sadler, surprised the audience when he announced he was relinquishing the chairmanship in favor of Col. Ernest O. Thompson. He thanked oil operators for their co-operation in the past and praised Thompson. It is probable that Thompson will be chairman only to the first of the year when Terrell leaves office, as the commission chairmanship has been rotated each two years and it will be Commissioner Lon A. Smith's turn next.

Allowable Adjusted

New basic allowables for Texas fields were placed at 1,687,619 barrels as of Oct. 1. From this figure the estimated decline through Saturday and Sunday shutdowns brings the average net daily allowable down to 1,275,122 barrels. The Oct. 1 basic figure is 38,126 barrels greater than on September 1.

A few upward adjustments in base allowable were made, chief of these being to the Yates field of Pecos county which was given an increase of 7500 barrels daily to 28,597 barrels. Increase was made because the allowable had been reduced to the point where effective use was not being made of reservoir pressure.

Increases were given to Sugarland, Thompsons and Webster fields of South Texas, because of showing of greater demand for low cold test crudes. Nearly all other changes were slight reductions.

Decline of 10.34 pounds per square inch in bottom hole pressure in the East Texas field was reported by the commission engineers for the period Aug. 8-Sept. 8. Along with this drop, a little greater than normal, has been an increase in water production. There is now being produced 103,000 barrels of salt water daily with the oil, said commission engineers, and recent increase in this has been about 3000 barrels daily. Prediction was that the field would be making 150,000 barrels of water daily by Jan. 1, unless restricted. That would be approximately one barrel of water to each barrel of oil, based on the current rate of oil production.

N.O.M.A. Schedules Anti-Trust Subjects

N. P. N. News Bureau

WASHINGTON, Sept. 19. — Paul E. Hadlick, secretary of National Oil Marketers Assn. today announced the three principal speakers for the association's annual convention at Chicago Oct. 24 and 25 as follows:

William J. Kemnitzer, economist and petroleum technologist, author of a recently published book "Rebirth of Monopoly", who will talk on "Some Phases of the Monopoly Problem as Related to the Oil Industry."

James F. Lawrence, Tulsa, who, as attorney for the Petroleum Rail Shippers Assn., has filed a complaint with Interstate Commerce Commission attacking the rail and pipeline freight charges now existent (N.P.N., Aug. 24, p. 10). Lawrence was a prominent figure in the fight against the railroad's estimated weight of 6.6 pounds per gallon for shipment of gasoline.

Wendell Berge, chief assistant to Thurman Arnold, head of Justice Department's anti-trust division and Arnold's alternate on the O'Mahoney monopoly committee.

Berge will discuss the anti-trust laws in relation to the oil industry, the Hadlick announcement says, and Lawrence will discuss the broad subject: "The Cause and Cure for Independent Oil Men's Troubles."

Hadlick says that other features of the two-day convention, to be held at the Morrison hotel, will be announced later. There will be a trade exhibit of equipment, supplies and services used by oil jobbers, in addition to the fixed program.

Privately-Operated Trucks Are Faced with Regulation

(*Continued from page* 9)

united action of private carriers.

"The ICC has taken the best phase of its case first — the regulation of trucks hauling 'dangerous' articles (including petroleum products), in the hope of showing the need for such regulation," commented one company's representative. "Then, they expect that it will be easier to tackle the regulation of other private carriers."

Another important angle to the situation, Winchester pointed out, was the tendency of the states to adopt regulations similar to those put into effect by the ICC. So, while the ICC regulations might be applicable only to privately-operated trucks operating in "interstate commerce" (a term which grows more elastic all the time), the state regulations would catch all trucks.

Winchester cited the statement of ICC Chairman Splawn, in which it was said:

"The common carrier companies, such as the railroads and the regulated trucks on the highways, are available to all sorts of shippers and to the public generally. But individual companies and private corporations engaged in any sort of activity do their own transporting and their transportation is now mounting into the billions. It is these non-common carriers which have demoralized the rate structure for the common carriers. There is a problem which the traffic men of this country are best equipped to attack. Just how far should an individual corporation not a common carrier go in transporting its own goods?"

This statement of the ICC chairman as Winchester's paper pointed out, has been interpreted by railroad-minded commentators as meaning, "Just how far should manufacturing or trading companies *be allowed to go* in transporting their own goods?"

Splawn's statement indicates that the case of the private carrier has already been pre-judged by at least one member of the ICC, it was suggested.

Winchester said that in all his contacts with legislative work of an automotive character, "I have never had the good fortune of seeing an original proposition in the form of a proposed law based upon the facts."

"As a whole," Winchester added, "motor vehicle legislation of a restrictive nature has come from direct efforts to stifle this new tool and the net results, in my opinion, are many laws that hurt the states and the unions and prevent the proper functioning, in the public interest, of highway transportation in many places."

He cited the federal motor carrier law as an instance of what he had in mind, pointing out that the men who had pioneered the original draft of the truck law had succeeded in retaining the declaration of policy which committed Congress to fostering and developing highway transportation.

But the motor carrier law, in its administration, has fallen far short of helping highway transportation, according to Winchester, who added:

"I have definitely arrived at the conclusion that the state of affairs of the common and contract carriers because of regulation is at the present time in a very chaotic condition. The good that has been accomplished has not offset the damage that has been done to the industry as a whole and I seriously question if the situation as it exists today has been a paying proposition for Uncle Sam, the public or the individual trucker."

Truck Law Cited

Further supporting his conclusion that privately operated trucks face regulation, Winchester cited Section 204 (a) (3) which reads:

"To establish for private carriers of property by motor vehicle, if need therefor is found, reasonable requirements to promote safety of operation, and to that end prescribe qualifications and maximum hours of service of employes and standards of equipment. In the event that such requirements are established, the term 'motor carrier' shall be construed to include private carriers of property by motor vehicle in the administration of Sections 204 (d) and (e); 205; 220; 221; 222 (a), (b), (d), (f), and (g); and 224."

He pointed out that the provisions referred to at the end of the section, which would be applied to private carriers, if the ICC decides that it is necessary, authorize detailed regulation for privately-operated trucks, such as filing of reports and contracts, adopting accounting methods, providing access at all times to lands, equipment, records for inspection by the ICC agent and countless other detailed items of regulation.

Why Private Trucks?

"One can well ask", Winchester said, "how did the private operators happen to be included in the Motor Carrier Act when the type of business which they conduct is so basically different from that of the common and contract carriers. Certainly it has not been on the demand or request of any established trade association to represent these concerns, nor the concerns themselves. So it becomes apparent to one who studies the situation that the demand came from the groups who were specializing in rail or common and contract carrier operation and unfortunately the private carrier was poorly organized from a trade and political standpoint to oppose the proposal which led to their being included under this regulation."

Best weapon for the private carriers to protect their interests would be a nation-wide organization of all types of private carriers in every line of business, Winchester concluded.

O'Mahoney Probers Get Data from FTC

N. P. N. News Bureau

WASHINGTON, Sept. 19. — Federal Trade Commission has turned over to the O'Mahoney monopoly investigating committee all the records the FTC has been acquiring in its inquiry into alleged violations of the Robinson-Patman anti-price discrimination law involving the oil industry, it was learned today.

In turning over its R-P law files, however, the trade commission retained the records in one case, although commission officials profess to attach little significance to the case in itself. This case, it is understood, involves charges that certain major companies discriminate in prices in selling to retailers and to commercial consumers who, in turn, resell.

DISCUSS TRUCK RULES

ATLANTIC CITY, N. J., Sept. 17. — A meeting will be held Sept. 22 at the American Petroleum Institute in New York to decide what action the oil industry shall take regarding the hearings announced by the Interstate Commerce Commission for October on proposed safety regulations for trucks hauling in interstate commerce "dangerous" articles (including inflammable liquids such as gasoline) and the need for applying such regulations to privately-operated trucks.

Hearing dates on the proposed regulations before an ICC representative, have been set as follows. Los Angeles, Oct. 10; Tulsa, Oct. 17; and Washington, Oct. 26.

Minor Revisions in Tulsa SAE Program

CLEVELAND, Sept. 15.—The final revised program of the Society of Automotive Engineers for its National Fuels and Lubricants Meeting in Tulsa Oct. 6 and 7 has some minor changes over the preliminary program as announced in NPN for Aug. 10.

The paper on Motor Vehicle Maintenance by R. G. Horridge, Southwestern Bell Telephone Co., has been moved up to the afternoon of Oct. 6. The paper on Characteristics Relative to Ring Sticking and Engine Cleanliness of Mid-Continent Lubricating Oils, by John V. Brazier, Barnsdall Refining Corp., and Sidney Born, University of Tulsa, will be given the afternoon of Oct. 7. The two papers traded times for presentation.

The paper on the Four Ball Testing Apparatus will be by a representative of Bataafsche Petroleum Maatschappij, rather than by T. B. Rendel and F. L. Garton, Shell Petroleum Corp., St. Louis, as previously announced.

Howard Greene Dies

BRADFORD, Pa., Sept. 19.—Howard H. Greene, executive vice-president of Kendall Refining Co., was killed last night when his privately-owned plane crashed sometime in the night near Berlin, N. J., about five miles from Camden.

Greene took off from Atlantic City about 5 p. m. Sunday, returning to Bradford from the annual meeting of the National Petroleum Association. His demolished plane was found at 7:30 this morning.

Greene had been with Kendall since 1926. He is survived by his wife, Mabel Bartlett, and four sons.

Two years ago, Greene made a forced landing on the beach at Coney Island, N. Y., when his supply of gasoline ran out while on his way from Bradford to Roosevelt field, Long Island, with Atlantic City and the National Petroleum Association's convention as his ultimate destination.

'Not Hostile To Business,' Says O'Mahoney To N.P.A.

ATLANTIC CITY, Sept. 17.—The Temporary National Economic Committee, better known as the O'Mahoney anti-monopoly committee, is not "hostile" to business, according to its chairman, Senator Joseph C. O'Mahoney, Wyom., who devoted much of his speech at the National Petroleum Association's 36th annual convention to pleading for business' co-operation.

O'Mahoney's speech was the highlight of a program which featured many phases of the relations between business and government, ranging from regulation of privately-operated trucks through the gamut of taxation to a newspaperman's backdoor slant on the doings at Washington.

The theme of O'Mahoney's remarks was that the bulk of American business today has become national in scope, although not subjected to national regulation except for some "pecking" here and there; the essential thing, he said, is to find a *national* means of regulating business. However, he gave little inkling of the plans of his group or scope of its inquiry.

Although some of O'Mahoney's remarks might be construed as arguments for the federal incorporation law he has proposed at the last several sessions of Congress, he insisted:

"I have no thought of using the committee as an instrumentality for enactment of the federal incorporation bill. I will drop that idea, if facts developed by the committee disclose a better means of accomplishing the same end."

Politicians and Business

The committee will provide a forum, O'Mahoney said, for business leaders and politicians to sit down in harmony, discuss facts, determine the problem and how to meet it.

O'Mahoney emphatically denied that his committee was "dominated by the Department of Justice."

"It is not the purpose of the committee to discover law violations—if so, a grand jury would be the proper proceeding," the senator said.

He said the committee's doors would be always open; adding, "we seek the co-operation of business, and we are getting it."

He expressed the view that business should be free to govern itself, within limits set by federal law. "Business should be free from all arbitrary control, of any financial group, private group or government group," he added.

Trade Associations

Preceding O'Mahoney, Charles J. Brand, secretary of the National Fertilizer Assn., gave a talk on the development and significance of trade associations.

Brand suggested that the O'Mahoney committee consider establishment of some sort of administrative or quasi-judicial agency of the government to make "temporary interpretations" of anti-trust laws and other legislation affecting business practices, pending a final determination by the courts.

Group conferences on Sept. 15 were on taxation and transportation.

Lovell H. Parker, formerly tax expert for the joint congressional committee on taxation, predicted there would be a new tax bill in 1939, with the treasury department renewing its drive on the depletion allowance and other provisions it regards as "loopholes."

Difficulties arising under the pipeline transportation tax were outlined by J. R. Edmonston, of Gulf Oil Corp., who led the roundtable discussion on this topic.

Social Security Tax

Following the Internal Revenue Bureau's ruling that commission agents and their helpers were "employes" of the supplying company under the social security tax law, some companies have paid the unemployment compensation tax under protest, still contending that it was inapplicable particularly in the case of corporations functioning as commission agents, according to John E. Winslow, St. Louis, of Shell Petroleum Corp.

Several company representatives present said they had had difficulties getting commission agents to submit reports on their expenses so that the portion taxable as "compensation" under the social security tax could be segregated. Some reported that several states had been persuaded to accept an average per-gallon expense so that the non-taxable portion of commission's agents' gross compensation could be segregated.

Winslow warned that there is a definite move on foot to wipe out the merit-rating provisions in the state unemployment compensation laws, which provide for lower tax rates for employers with a low labor turnover records of few employe separations.

Elimination of merit-rating would mean a loss of present savings, he said, pointing out that his own company in Wisconsin, for example, had had a "substantial" saving because of the merit-rating clause.

In 800 cases in Wisconsin where employers had contested claims under the unemployment compensation law, 50 per cent of the claims were disallowed, Winslow said. This tended to keep down the total claims which in turn was reflected in lower tax rates.

Truck Regulation

Warning that the privately-operated truck is on the verge of government regulation was given at the transportation group conference by J. P. Winchester (Standard of New Jersey), chairman of the American Petroleum Institute's automotive committee.

Light was thrown on three more facets of business-government relations at the Sept. 15 afternoon sessions. Carle C. Conway, board chairman of Continental Can Co., said there were "encouraging signs" of greater harmony between government and business. An answer to A. A. Berle's memorandum to the O'Mahoney Committee (See N. P. N., Aug. 24) was given by Dr. Joseph E. Pogue, vice president of Chase National Bank. Earl Godwin, Washington newspaperman and radio commentator, amused the N. P. A. members with anecdotes about the New Deal, predicting that the incoming congress would be filled with all shades of liberals and conservatives, with "a fight, and a hot one in prospect". (See N. P. N., Sept. 14th for summaries of papers by Conway, Pogue and Godwin).

The convention closed with a banquet and entertainment on Sept. 15. Many N.P.A. members and their friends remained over for the breakfast given Sept. 16 at the Sea View Country Club by the Ethyl Gasoline Corp.

N.P.A. Re-elects Officers

ATLANTIC CITY, Sept. 17.—All officers of the National Petroleum Assn. were re-elected at the association's 36th annual meeting here Sept. 14-15. A new member, Noel Robinson, of Tide Water Associated Oil Co., was elected to the board of trustees. In the absence of Charles E. Suhr, of The Pennzoil Co., who is in Europe, N. H. Weber, of Pure Oil Co., vice president, gave the opening address of welcome.

Treatment of Pennsylvania Lube Oils With Propane Is Explained To N.P.A.

ATLANTIC CITY, Sept. 17.—Three outstanding advantages are obtained from propane treating of Pennsylvania lubricating oil fractions, W. B. McCluer of Kendall Refining Co., and H. O. Forest and J. T. Dickinson, of M. W. Kellogg Co., pointed out in discussing the results of this process of treatment in a paper delivered by McCluer before the National Petroleum Assn.

The ratio of neutrals to bright stocks is increased, a problem which has offered difficulties to refiners for many years, and has been accentuated by the trend toward lower viscosity lubricants in the automotive industry. The qualities of the finished lubricants are improved, and production costs are lowered by propane dewaxing and deresining, they stated.

Two main items of refining costs are present in lubricant production from residual oils—dewaxing and deresining, and decolorizing. Over a period of six years the neutral requirements in blended Pennsylvania oils have increased from 47 per cent of the finished product to 65 per cent.

To meet this changing condition refiners have been forced to run more crude to meet the neutral demands, and as a consequence have produced a surplus of bright stock, since 2.5 to 3 times as much bright stock is produced per barrel of crude as the neutral made. The authors showed how the use of propane for dewaxing and deresining has improved the neutral-bright stock ratio from 0.36 to 0.81.

Propane also improves the quality of the finished oils, as in carbon residue and oxidation resistance, it was said. Costs of decolorizing (filtering) operations are greatly reduced, as well as those of dewaxing by older methods, they showed. Improvement in product qualities was not the primary aim in adopting propane, but rather to increase the neutral-bright stock ratio which was plaguing Pennsylvania refiners.

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Sales Efficiency Of PLUS Gasoline

The great skill that has been developed in the marketing of gasoline and oil was impressed on the casual guest who sat through the presentation to refinery salesmen of the fall and winter campaign of Sovereign Service at Kansas City a week ago. Gathered there were a hundred salesmen, sales managers of member refineries, executives and supervisors and assistants in Sovereign Service to hear General Manager Sullivan tell how the gasolines of a half dozen Independent Kansas and Oklahoma refineries would be sold in the next six months.

The details of that plan would make news but they belong to Sovereign Service to tell the waiting customers at the appointed time; but I am sure, the Sovereign management will not object to mention of the impression the campaign made on the writer.

For years in some cases even 25 years or more, these refiners have shipped gasoline to their jobber customers that was just as nameless and unknown to the general public as water from a hydrant. The jobber for the most part in turn sold it as just gasoline. Then the jobber began giving the gasoline a name but as his customers moved about the country in trips of hundreds of miles, a name known locally failed to hold the business against the national brands that began to appear a dozen and more years ago.

These small Kansas and Oklahoma refiners sought to meet the need for names of greater reputation by establishing their own refinery-owned brands. This helped but more was needed, well planned advertising and sales promotion material, made effective by selling ideas, and a well trained personnel employed to invite patrons to well built, well kept and in every way high class gasoline outlets.

All of this spells sales and efficiency management and that is what this group of refiners have put behind their individual brands under Sovereign Service. This widens the gap still more between the efficient and the inefficient, between the well run stations and those poorly run. Sovereign Service requires oil marketing properties to be up to a certain standard before they are accepted. It requires that they not only maintain that standard but raise it when called upon, and talk at the meeting was of still higher standards. To insure this, Sovereign Service has its own goodhousekeeping inspection forms for its customers' service stations.

All of this is an old story to most jobbers, because this same type of sales promotion work, this same insistence on efficiency and good housekeeping in management is required by all of the important gasoline brands.

But one wonders if the industry, both the owners of the brands and the licensees under them, have stopped to add up all the help to better and lower cost selling there is behind these brands? One wonders if the industry appreciates that the brand is far more than just a name printed in advertisements and painted on bill boards. The name is valuable and attracts customers but what to the mind of the casual visitor at such a sales meeting as at Kansas City the other day seemed most important, was the *SALES MANAGEMENT* that lay behind the name and the many activities that sound selling today requires that are grouped under those words *SALES MANAGEMENT.*

It is the keenness and criticalness of this modern *SALES MANAGEMENT* that is behind the gasoline and oil brands of today that makes for profits in the face of the sharpest competition most any industry has offered the American public. That is the PLUS that branded gasolines have when they leave the modern refinery.

Thanks to Mr. Sullivan for an opportunity to peer behind the screen at tomorrow's sales plans of a democratic group of small refiners who are fighting the battle against high crude costs and low tank car prices with modern salesmanship and Plus gasoline.—W.C.P.

Gasoline Price Laws Still Experimental

Philadelphia gasoline retailers want the oil marketing companies there to establish posted prices to the consumer on their brands.

While all sympathize with the plight of the Philadelphia retailers in the disorganized markets that have existed there for a good many years, the efficacy of these fair trade price posting laws has yet to be proved.

The one in nearby New Jersey has only been operating a few months. Up to a week or so ago, it looked as if it was working, but in the past few days or so, local fights have developed, prices have been influenced by low prices outside the state and by the usual independence of thought and action in the oil industry. All this has been disturbing the seeming peace of the new price posting era.

Price posting and price maintenance by the supplier with the backing of a law may be the answer to many of the oil industry's price difficulties. It has become quite obvious since the inauguration of the dealer licensing plan three years ago, starting in Iowa, that the retailer of gasoline is hardly qualified by training or economic strength to take care of his own price. Some stronger factor in the industry, seemingly will have to do it for him.

However, it remains to be seen whether the New Jersey price maintenance plan will exactly fit the needs of the industry. A few more months and the industry will have more complete data from that operation on which to base sound judgment. The idea is still too new in New Jersey to say it will work.

As desirable as the plan may be, it still is up to the individual dealer and oil company to see that the plan works. There can be a law and effort can be made to enforce it, but unless the people covered by the law themselves obey it, the law is useless. One need point only to the late prohibition law.

Oil Jobbers Show Interest In Tank Car Market Price

CLEVELAND, Sept. 17. — Reawakening of interest in the open spot market for gasoline has been indicated the past week or so among Independent oil jobbers in one state in Standard of Indiana territory.

Five jobbers in this mid-western state, including several who handle major company branded products, reported to *Platt's Oilgram* that they had purchased in the open market 70-72 octane gasoline from Independent refiners at prices of 4.875 and 5 cents on a basis of f.o.b. Group 3. Four of these jobbers sent in invoices or other data supporting these prices.

All but one of the purchases reported by these jobbers were from other than Oklahoma refiners; the prices mentioned corroborated the quotations published in *Oilgram's* Mid-Western Tank Car Market which is based on price information gathered at Chicago on gasoline from all refining districts sold on a Group 3 basis, regardless of origin.

The exception was a purchase by a jobber from an Oklahoma refiner of 70-72 octane at 4.875 cents f.o.b. Group 3 (Oklahoma). This price was below the low of the range shown in *Oilgram's* price tables for the Oklahoma refinery market which was based on prices refiners said they were quoting for open spot market sale to jobbers. The jobber said his transaction was an open spot market sale, not based on market-date-of-shipment, and not the result of a contract, express or implied.

Without disclosing the jobber's identity *Oilgram* checked with the refiner involved and was told that no open spot market sales (which are the only kind of sales considered by *Oilgram* in determining its market quotations) had been made at 4.875 cents in the past several weeks, although some gasoline had been shipped on contract at that price during the period in question.

When the jobber declined to permit his name or the data he had submitted to be disclosed to the refiner for the purpose of pinning the matter down exactly, *Oilgram* published, in its issue of Sept. 16, the following statement:

Oilgram Statement

"In the last several weeks, since crude and tank car markets of the middle west have been weakening, *Oilgram* has received information as to allegedly lower gasoline prices from five jobbers in one state in Standard of Indiana territory. This information corroborated *Oilgram's* Mid-Western Tank Car Market price quotations, which are reported from Chicago and show the influences of low-priced goods from all refinery districts handled through brokers on a Group 3 basis. The prices supplied to *Oilgram* by these jobbers, with one exception, were on shipments from other than Oklahoma refineries. The exception reported was a shipment from an Oklahoma refinery the forepart of this month at 4.875c for 70-72 octane. At *Oilgram's* request the jobber supplied his copy of the original invoice, detailed specification test, and the seller's confirmation of the order, *Oilgram* to keep the jobber's identity confidential.

"*Oilgram* questioned the refiner without divulging the name of the jobber. The refiner reported he had made no sales in the open spot market at 4.875c and that his asking price was 5.50c during this period. The refiner denied any sale in the open spot market under the price he quoted to *Oilgram* and insisted that such transactions as had been made at less than that price were on contracts.

"*Oilgram* went back to the jobber and asked his permission to disclose the particular transaction to the refiner for the purpose of pinning the matter down exactly. The jobber declined because, he said, he felt he would be blacklisted by the refiner. The jobber continued to insist that the transaction was in the open spot market and not covered by contract. There is thus raised for determination by whomever is interested the question of the veracity of the jobber and the refiner.

"In view of the active interest the past several weeks of jobbers in one state of the middle west and their submittal of information on prices to *Oilgram*, *Oilgram* publishes these facts, so far as it has been able to obtain them, in regard to this transaction, and will be glad to report any further facts, if and when they are supplied."

Illinois Jobbers Attack Proposal That Oil Be Made 'Public Utility'

CLEVELAND, Sept. 19.—In an editorial, headed "Government Offers Alibi," the *Oil Can*, official organ of the Illinois Petroleum Marketers Assn., expresses opposition to the suggestion of Assistant Attorney Thurman Arnold, assistant attorney general in charge of the anti-trust division, that the oil industry be regulated as a public utility.

Text of the *Oil Can* article, follows:

"The Department of Justice apparently lamenting their defeat as a result of Judge Stone's decision are now calling the public's attention to the laxity of the federal anti-trust laws.

"Thurman Arnold, assistant attorney general, in a recent radio broadcast commenting on the Madison oil trial charged that major oil companies have extended their control of petroleum marketing to such an extent that it is very difficult for an Independent to obtain a foothold. He admitted that it is beyond the scope of the anti-trust laws to regulate such inequitable conditions, but stated that Congress might well consider the marketing of gasoline in the medium of a public utility.

"Reading between the lines of Mr. Arnold's remarks, it would appear that the Federal Government has visions of bringing the oil industry under the strong arm of the Government, to be regulated as a public utility and that the Department of Justice may recommend just this to Congress at the next session.

"Well, anything can happen under the 'New Deal' regime but there is not an oil man we believe, large or small, who would care to have his business regulated by the Federal Government. Oil men are capable of running their own business and they would rather fight for their rights within their own ranks rather than be dictated to by Government.

"It has been proven time and time again that the Government can neither capably nor efficiently operate a private business and with such a history who is the oil man that would ever approve the Government trying to run the oil business. Already we are so hampered with Government regulations that every oil man spends about half of his time making out one report or another to satisfy the whims of government agencies.

"What we need is less governmental interference in business, and more thoroughness in Washington in enforcing the laws we already have."

Wider Federal Law Than Connally Act Is Needed—Ickes

N. P. N. News Bureau

WASHINGTON, Sept. 19. — First rumblings of a drive in the next Congress to make the Connally "hot oil" law a permanent statute on the federal law books, possibly with a broader scope than it now possesses, are being heard in Washington.

An attempt was made during the first session of the Congress just ended to make the law a permanent one in its present form—and a bill to that end was introduced by Senator Tom Connally of Texas.

But opposition to the measure, coming chiefly from independent marketers, lead by Paul E. Hadlick, secretary of National Oil Marketers' Assn., while unable to kill the bill, resulted in extension of its life for a two year period, rather than indefinitely. Proponents accepted the shortened life-span grudgingly, but took the amended bill rather than run the risk of the "hot" oil law lapsing.

Now the time when the Connally law must either die, or be further extended, is again nearing. Unless extended by the next session of Congress, the law automatically expires next June 16, 1939. If it dies, federal control over interstate shipments of 'hot' oil will be a thing of the past, a situation which a large portion of the oil industry, with the exception of some independent marketers headed by Hadlick, will battle to prevent.

Ickes Comments

Meanwhile, Interior Secretary and former Oil Administrator Ickes, whose department now administers the Connally Act, has declared not only that he thinks the "hot" oil law should be made permanent—a position similar to that he took at the 1937 hearings—but that something should be done to provide for "closer co-operation between state and federal governments in conserving our oil supply."

Just what Ickes had in mind as a method of bringing about the co-operation he thinks is needed is not known. When he was asked how he proposed to do it he answered:

"I don't think I want to discuss that now. I'd rather wait until the bill (to extend the Connally Law) comes up."

TULSA, Sept. 19. — The Republic Drilling Co. of Houston has been awarded a certificate of honor for operating 345,201 man hours since its last disabling injury. Award was made by the Joseph A. Holmes Safety Assn.

1938 Gasoline Demand Holding Upward Trend

N. P. N. News Bureau
By M. G. VAN VOORHIS

CLEVELAND, Sept. 19. — A striking contrast to the general average decline in industrial activity and production of the first seven months of 1938, to 1932 and 1933 levels, has been shown by the demand for gasoline as compared with other demands and business activity. Gasoline demand, which has been hovering around the high mark set in 1937, now indicates it will exceed 1937 requirements before the close of the year, as shown by the chart on the front cover of this issue.

Even food sales declined this year, if the index of grocery chain store sales is any criterion, and it is interesting to note that this class of business has not yet returned to the level of 1929, while gasoline consumption is almost a half more in 1938 than in 1929. Apparently motorists will buy gasoline at the expense of their stomachs in order to enjoy the pleasures and advantages of motor cars.

The sharp contrast of gasoline consumption to other leading industries such as steel and manufacturing industries in general, is striking and holds all the way back to 1929. Thus, steel ingot production, which is the closest index of steel consumption, dropped to a level of 1933 production in the first seven months of this year. Freight car loadings did the same. General employment dropped back to below the 1935 level.

Building construction volume is shown rising above the 1937 level during the first six months of this year but a curve for value of building contracts awarded would show a similar sharp decline in 1938. Curves for general industrial activity and production also have this typical sharp drop. General employment was not far short of 1929 levels in 1937 but it also dropped in the first six months of this year below the 1935 average.

The total demand for all petroleum oils, if plotted on the chart on the cover of this issue, would also lie above the index of grocery chain store sales. The 1,103,200,000 barrels consumed in 1929 compares with a low of 938,800,000 barrels in 1932 (volume index, 0.85) and with 1,340,801,000 barrels in 1937 (index, 1.22). Total demand for the first six months of 1938 was 0.8 per cent lower than in 1937, representing a reduction of 5,080,000 barrels during this period.

Declines in domestic demand in 1938 are most evident in the fuel oils, which more nearly reflect industrial activity. The 1937 demand for residual fuel oils, gas oil and distillate fuels was 441,814,000 barrels as compared with 334,669,000 barrels in 1931 (1929 figures are not available), a gain of 32 per cent which compares with a 30 per cent gain for gasoline consumption during the same period. Fuel oil demand for the first six months of 1938 was 197,291,000 barrels as compared with 222,769,000 barrels in the same period of 1937, a decline of 11.5 per cent.

Domestic demand for kerosine has a better record of proportionate increase than gasoline. Demand rose from 36,032,000 barrels in 1929 to 54,951,000 barrels in 1937 and present indications are that 1938 demand will be two per cent higher. The volume index for kerosine in 1937 would be 1.53 as compared with 1929.

Lubricants showed the effect of the recession similar to general industry. In 1929 the demand was 23,609,000 barrels which came back to 23,374,000 barrels in 1937 but dropped back 17.5 per cent in the first six months of 1938.

Crude production first rose above 1929 figures in 1936 to supply the increasing demands but was influenced by the drop in crude stocks during this period from 429,191,000 barrels in 1929 to 288,184,000 barrels in 1936. Crude stocks hit a new 15-year low of 285,137,000 barrels in August, 1938.

Refinery runs to stills totaled 912,191,000 barrels in 1929, dropped below that figure in 1932-3-4, and totalled 1,183,440,000 in 1937.

Consumption of Gasoline as Compared with General Industrial Activities

	Gasoline Consumption Gallons	Steel Ingot Production Gross Tons	Freight Car Loadings (Av. Weekly) Cars	Employment Index	Grocery Chain Store Sales Index	Construction Volume Index
1929	14,677,554,000	56,400,000	1,014,000	100.0	100.0	100.0
1930	15,786,040,000	40,700,000	879,000	87.2	98.0	82.0
1931	16,621,104,000	25,950,000	715,000	73.7	93.8	69.5
1932	15,500,366,000	13,700,000	543,000	61.1	83.4	40.0
1933	15,438,324,000	23,300,000	557,000	65.8	78.1	32.2
1934	16,587,356,000	26,100,000	591,000	75.0	81.0	36.0
1935	17,716,811,000	34,100,000	606,000	78.3	87.1	42.6
1936	19,565,922,000	47,800,000	688,000	83.5	91.7	58.4
1937	21,146,204,000	49,507,766	729,000	94.8	93.0	53.9
1938	21,600,000,000*	12,801,202‡	550,000‡	76.2†	91.8†	55.5†

* Estimate based upon ratio of first half-year to second half-year in 1938 being the average of similar ratios for 1936 and 1937. On the basis of last minute figures for seven months demand, slightly lower this year than last, the average ratios of 1936 and 1937 still indicate a gain for 1938.

‡ First 7 months average. † First 6 months average.

Gasoline consumption in U. S. by automobiles as compiled by the American Petroleum Institute.

Steel ingot production and consumption are virtually synonymous. Figures from American Iron and Steel Institute.

Freight car loadings are derived from American Railway Assn. statistics published by Standard Statistics Co.

Employment indices are derived from U. S. Bureau of Labor Statistics indices based on years 1923-1935.

Grocery sales indices of chain stores are derived from indices published by Standard Statistics Co.

Construction volume indices are derived from indices published by The Engineering News Record.

Gain In 'Gas' Demand Seen Without Business Recovery

N. P. N. News Bureau

CLEVELAND, Sept. 19.—Gasoline consumption during the fourth quarter of 1938 and first quarter of 1939 will be above that of this six-month period a year ago, whether there is a business recovery or no change in business activity, it has been estimated.

Figures presented by Joseph E. Pogue, vice president of the Chase National Bank of New York and member of the advisory committee on economics of the Interstate Oil Compact Commission, show a gain of 0.4 per cent in the fourth quarter of this year even with no change in business activity and a decline of 0.2 per cent in the first quarter of 1939 below this quarter of 1938. With a business recovery the gain in demand for the last quarter is expected to be 2.6 per cent and for the first quarter of 1939, 3.1 per cent.

These estimates were presented by Pogue at a meeting of the Interstate Oil Compact Commission in Colorado Springs July 29 and 30 and developments since that time have produced no reasons for changing the estimates, he reported recently. Two complete sets of figures were presented at this meeting to give some idea of what future demand for crude oil would be. Probably the low point of the depression has been passed, he said.

Estimate of Oil Demand for the Next Three Quarters on Basis of (A) No Change in Business and (B) Business Recovery

(As presented at the meeting of the Interstate Oil Compact Commission, Colorado Springs, July 29-30)

	A—No Change in Business			B—Business Recovery		
	— 1938 —		1939	— 1938 —		1939
	3rd Q	4th Q	1st Q	3rd Q	4th Q	1st Q
Federal Reserve Board Index	76	76	76	79	85	90
Total motor-fuel demand, TBD	1705	1495	1318	1722	1527	1362
Change from year before, per cent	—1.2	+0.4	—0.2	—0.2	+2.6	+3.1
Motor-fuel inventory objective, MB	66.8	68.1	81.0	67.3	69.1	83.0
Required runs of crude to stills, TBD	3150	3075	3005	3200	3160	3130
Required domestic crude, TBD	3400	3315	3245	3450	3400	3370
From stocks, TBD	100	50	25	100	50	25
From domestic fields	3300	3265	3220	3350	3350	3345

TBD = Thousands of barrels per day.

The accompanying tabulation shows an estimated gasoline consumption of 1,527,000 barrels per day during the last quarter of 1938 and 1,362,000 barrels per day during the first quarter of 1939, if there is a business recovery. With no change in business activity the figures are 1,495,000 barrels and 1,318,000 barrels per day respectively.

The difference between the two figures for the 92 days of the fourth quarter of 1938 is a total of 2,944,000 barrels and for 90 days in the first quarter of 1939 is 3,960,000 barrels.

The industry's motor fuel inventory objective, whether there is recovery or not, should be less on March 31, 1939, than on that day in 1938, the accompanying table shows. This level of 81,000,000 or 83,000,000 barrels respectively compares with 90,600,000 barrels of stocks actually reported March 31, 1938. The present trend of motor fuel stocks, corrected for seasonal variation, is leveling off to a slower rate of gain than existed during 1936 and 1937.

If stocks continue to decline through September as in the past three years there would be a possibility of their reaching the lowest mark of 1937. Stocks of fuel oil are now far ahead of 1937, so that increased production is apparently not justified from this standpoint.

Further Drafts On Stocks To Hold Down Well Output

N. P. N. News Bureau

TULSA, Sept. 17.—Further reductions in allowable crude oil production in the coming months are predicted by some market observers, despite the severe proration that has prevailed throughout 1938.

During the first seven months of 1938 there was a two per cent increase in demand over the similar period of 1937 for crude oil for refining, for that used as fuel and for that exported, according to the U. S. Bureau of Mines figures. Because of the storage liquidation policy of most companies having substantial stocks, production from wells was less, comparing the same periods, the figures being 705,744,000 barrels in 1938 against 730,887,000 barrels.

From the first of this year crude oil stocks held in the U. S. domestic and foreign, were depleted by 17,420,000 barrels to 288,664,000 barrels, to July 31, as reported by the U. S. Bureau of Mines and the forecast is for further withdrawals. On July 31, 1937, total stocks were over 308,000,000 barrels.

Inventories Adjusted

The year thus far has been one of inventory adjustments, reversing the trend of 1937 and the extent to which this will be pursued is not predictable. Included in the amount of crude which is being taken from large storage, as distinguished from current working stocks which are turned over regularly, is a substantial amount in the Mid-Continent and Wyoming that has been in tankage for years, crude from fields that were developed rapidly and could not be absorbed by the then current market. Several substantial tank farms have been emptied and the tankage removed and others are in process of being liquidated. In late years, proration in most of the principal producing states has made it possible to keep oil in its natural storage until needed, minimizing the need of aboveground emergency storage.

Barring an upturn in demand caused by war, the outlook seems to be for some adjustments downward in allowable production in the southwest over the rest of 1938. To this condition, Illinois is expected to make further contribution, as the state's output, now hovering around the 80,000-barrel figure, is expected to reach 100,000 barrels daily or more by the end of this year. Within the limits of pipeline outlet, all this production is being absorbed by the market, chiefly at the expense of Oklahoma and Kansas supplies.

Fewer Wells Completed

Total well completions this year so far have been about 3500 less than the number at this time last year, when the mark was about 23,000. Illinois, Arkansas, Kentucky and Louisiana have shown substantial gains, other states have lost.

Aside from Illinois, the principal areas in which substantial gains in new production may be expected—affording new problems for proration authorities—are the Schuler area of south Arkansas, several Louisiana Coastal fields, and a new area in south Texas. The latter, in Starr and Jim Hogg counties, is expected to be one of the largest fields, if not the largest, yet found in the territory southwest of Corpus Christi. The two wells that have been completed indicate continuous production for 12 miles; how much this distance will be stretched is a question to be determined by drilling.

The K.M.A. field, scene of principal activity in north Texas this year, may have a new major outlet for its production if plans now being made mature. Such new outlet would be through a new trunk line to the Gulf Coast but it would not be available for some months. The supply of crude oil elsewhere in the state is so great that purchasers now buying in K.M.A. promise no material change from their present takings.

Seven Months' Heavy Fuel Oil Demand 15 Per Cent Under '37

N. P. N. News Bureau

CLEVELAND, Sept. 20.—Today's large stocks of residual fuel oils are one of the biggest problems which will confront the U. S. petroleum industry in coming months.

In relying on the heavy industries to absorb these stocks, the oil industry today faces much of a gamble. The refiner can hold the whip hand if he increases his throughput of cracking stock, or if he revises his cracking operations to produce less heavy fuel oil, it is the opinion of many observers.

While there are estimates from time to time by authoritative sources of the trend of operations for the heavy industries which consume large quantities of heavy fuels, the oil industry thus far has not been able to balance its production of the heavy fuels with demand, as closely as has been the case with motor fuel.

A review of production, domestic demand and stocks of the residual fuels for the first seven months of 1937 and 1938 is shown in Table 1.

In the face of a sharp decline in demand in the first four months of 1938 as compared with 1937, production increased, and stocks accordingly mounted steadliy.

Beginning in May of this year, production was curtailed substantially below production in the same 1937 months, but not proportionately with the decline in demand. Stocks continued to mount until a peak of 99,363,000 barrels was reached on July 31 at which level stocks were 18.07 per cent above stocks on July 31, 1937.

For the seven months, production of residual fuel oils was 170,931,000 barrels, a decline of 2.59 per cent from production of 175,481,000 barrels during the first seven months of 1937.

Domestic demand for the first seven months of 1938 was 162,719,000 barrels, a decline of 14.86 per cent from demand of 191,118,000 barrels in the first seven months of 1937.

1938-39 Season Will Top Last In Oil Demand

N. P. N. News Bureau

CLEVELAND, Sept. 19.—The 1938-39 heating season, now starting in the northern states, will add to the heating oil market during the winter season a demand for 15,000,000 more barrels of oil than were consumed last year, it has been estimated. The season is starting with 70,000 more burners in use than at the start of last winter, of which 54,500 are domestic installations and 15,500 commercial and industrial burners. This increase is estimated on the basis of manufacturers' shipments for the first six months of 1938 as reported by the Bureau of the Census.

These burners mean to the heating oil market in added demand what 625,000 new motor cars would mean to the gasoline market.

The 70,000 new burners starting off this season will consume 10,000,000 barrels of heating oil and an additional 70,000 burners expected to be installed during the season will consume 5,000,000 barrels. The total increase will represent roughly 13 per cent of the 1937 sales of heating oils.

These figures for consumption are based upon an average annual consumption of 48 barrels for domestic burners and 500 barrels for commercial burners which are used in larger buildings, such as apartment houses and public buildings. Burners in operation only a part of the season are expected to burn half the volume of those in use the whole season.

Previous Year's Gains

In 1936, the last year for which the Bureau of Mines has published official figures on heating oil sales, the total volume of sales was 99,257,000 barrels, an increase of 22,404,000 barrels over the preceding year. This gain corresponds with 200,000 additional domestic burners and 18,400 commercial burners in use that year over 1935. A sales increase of 16,-

TABLE 1

Comparison of Production, Demand and Stocks of Residual Fuel Oils, January-July, 1938, with January-July, 1937

(Figures in Thousands of Barrels)

	Production			Domestic Demand			Stocks		
	1937	1938	% Change	1937	1938	% Change	1937	1938	% Change
January	25,433	26,204	+ 3.03	28,119	25,144	—10.58	83,276	83,902	+ 0.75
February	22,222	23,866	+ 7.40	27,311	23,627	—13.49	80,571	85,753	+ 6.43
March	25,081	25,328	+ 0.98	29,682	25,696	—13.43	78,435	86,920	+10.82
April	23,896	24,833	+ 3.92	27,709	22,279	—19.60	77,318	90,893	+17.56
May	26,015	24,392	— 6.24	25,729	22,447	—12.76	79,158	93,753	+18.44
June	25,769	22,761	—11.67	26,060	22,278	—14.51	81,224	95,690	+17.81
July	26,893	23,547	—12.44	25,849	20,548	—20.51	84,154	99,363	+18.07
7 Mos. Total	175,481	170,931	— 2.59	191,118	162,719	—14.86	.....	.....	.....

000,000 barrels of heating oils in 1935 over 1934 corresponds to nearly 141,000 additional domestic burners and 15,000 commercial burners. And 10,700,000 barrels added to heating oil sales in 1934 corresponds to about 94,000 more domestic burners and 14,300 more commercial burners in use than in 1933. The year 1935 is apparently the closest parallel to the coming heating season as far as market expansion is concerned.

In 1937, it has been estimated that the total sales of heating oil were about 18,000,000 barrels more than in 1936, or 117,000,000 barrels. During 1937 about 144,000 new domestic burners were put in use, making a total of 1,510,000 domestic burners and over 14,500 more commercial burners were installed making a total of 111,000 commercial burners at the end of the year.

Is On Low Side

This estimate for 1937 is lower than an earlier estimate by representatives of the burner industry, because it was found later that dealers' stocks had gained considerably during the year. This accumulation of burners was gradually decreased during the early months of 1938, according to dealers' reports, so that actual installations this year are believed to be more than is indicated by actual manufacturers' shipments.

Shipments are now said to be even closer to actual dealer installations than in previous years, since manufacturers have not been supplying dealers with more burners than they can dispose of. This factor was not taken into account by the writer in making the estimate of heating oil consumption for the coming heating season.

During the coming heating season it may be expected that heating oil sales will be over 130,000,000 barrels. This oil will come from three classifications as reported by the Bureau of Mines—gas oil and distillate fuel oil, residual fuel oils, and kerosine. This estimate does not include the so-called range oil used in distillate burners in ranges, stoves, water heaters, and space heaters which comprises kerosine or No. 1 furnace oil which may be a low grade kerosine or light fuel oil.

Bureau of Mines figures for demand of gas oil, distillate fuel oil, and residual fuel oil provide no basis for estimates of heating oil demand. The major portion of the oils of these classifications are used for other purposes. Any gain in heating oil demand in the past winter season was hidden by greater declines in other fields, particularly industrial uses.

Biggest July In 3 Years

It is interesting to note, nevertheless, that the demand for gas oil and distillate fuels in July this year was larger than for July of the past three years and perhaps sets the pace for the coming months. Residual fuel oil demand was 20 per cent less than in July a year ago and the first seven months were 15 per cent lower than a year ago, more or less corresponding to declines in industrial activity.

Kerosine demand, as a result of increasing use of distillate type burners, is expected to be at least 2,000,000 barrels greater during the coming heating season than last year. This would be a gain of 6 per cent in the total demand. Total range oil sales gain will probably be 3,000,000 barrels which is close to 10 per cent gain in this class of use. Manufacturers shipped only 60,305 distillate burners in the U. S. during the first six months of this year as compared with 108,881 burners in a like period of 1937 and 66,515 burners in 1936. However, the big months for distillate burner sales are just ahead. If 1938 sales do as well proportionally as in 1936, manufacturers will have to ship 330,000 burners in the last half of the year. The 1936 shipments were 406,051 and in 1937 they were 466,726.

The 350,000 distillate burners put in use last fall are probably responsible in large part for the 727,000-barrel increase in kerosine demand shown by the Bureau of Mines during the first seven months of this year over the corresponding period of last year and for 2,900,000 barrels increase in the last heating season (October to March) over the preceding year. If it be assumed that 300,000 more distillate burners are in use during the coming season then it can be expected that kerosine

Fuel Oil Production and Heating Oil Sales and Percentages of Total Production

(Figures in thousands of barrels from U. S. Bureau of Mines reports)

	Crude Runs to Stills	Gas Oil & Distillate Fuel Oil Production	Per Cent Yield	Stocks End of Year	Residual Fuel Oil Production	Per Cent Yield	Heating Oil Sales	Per Cent Refined Products
1930	927,447	81,551	8.79	16,390	290,947	31.36	43,279	4.7
1931	894,608	85,882	9.38	18,526	253,085	28.29	40,578	4.5
1932	819,997	69,467	8.47	14,110	225,283	27.47	44,264	5.3
1933	861,254	78,920	9.16	17,025	237,519	27.58	50,140	5.8
1934	895,636	94,972	10.60	21,957	240,381	26.84	60,822	6.6
1935	965,790	100,235	10.38	19,930	259,826	26.90	76,853	7.8
1936	1,068,570	125,906	11.77	22,719	287,968	26.97	99,257	9.1
1937	1,183,440	146,706	12.40	22,566	310,161	26.22	117,000[1]	10.0
1938*	670,613	85,523	12.8	.....	170,931	25.5	135,000[2]	11.0[3]
1937*	671,694	81,104	12.1	.....	175,481	26.1	.....	...
1936*	608,479	71,586	11.8	.....	164,621	27.1	.....	...

* First seven months.
[1] Estimate based on the increase in burners operating in 1937 as indicated by burner shipments.
[2] Estimate for the full year 1938 based on burner shipments during the first seven months of 1938 as reported by the Bureau of the Census.
[3] Estimate based on 135,000,000 barrels sold and 1,200,000,000 barrels of crude run to stills.

Heating Oil Season Starts With Prices At 1937 Level

CLEVELAND, Sept. 19. — Tank car market prices for the light fuel oils are entering the 1938 heating oil season at levels the same, or close to those which prevailed at the beginning of the 1937 season and slightly higher than levels prevailing in 1934, 1935 and 1936.

Taking the Mid-Western Tank Car Market prices, for example, as indicative of the general trend, it will be noted from the accompanying table that the average price of No. 1 prime white oil for the first half of September, 1938, of 3.75 cents a gallon is 0.19 cent lower than the September, 1937, average, but 0.56 to 0.83 cent higher than the September averages in 1934, 1935 and 1936. The No. 1 oil is used largely in the distillate, or range oil, type of burner.

The average price of 3.56 cents for No. 2 straw oil for the first half of September this year is the same as the September, 1937 average, but it is 0.84 cent, 0.63 cent and 0.62 cent higher than the September averages for 1934, 1935, and 1936, respectively. This oil is the best seller for domestic heating units.

The comparison of average prices for the first eight months of 1938 with yearly averages for the previous four years is strikingly similar to the comparison of September averages.

In 1934, the highest monthly average price for No. 1 was reached in December; in 1935, in May, in 1936, in April; in 1937, December; in 1938 to date, January.

The highest monthly average price for No. 2 oil in 1934 also was reached in December; in 1935, January; 1936, December; 1937, December; and to date in 1938, March.

Monthly Average and Yearly Average Prices, Nos. 1 and 2 Fuel Oils, Mid-Western Tank Car Market

(Figures in Cents per Gallon as Compiled by Oilgram)

	No. 1 Prime White					No. 2 Straw				
	1934	1935	1936	1937	1938	1934	1935	1936	1937	1938
January	3.24	3.38	3.44	3.77	4.25	3.19	3.22	3.20	3.47	3.81
February	3.03	3.27	3.56	4.00	4.13	2.94	3.06	3.30	3.66	3.78
March	2.89	3.17	3.71	4.03	3.97	2.72	2.92	3.29	3.59	3.84
April	2.99	3.16	3.91	3.94	3.84	2.69	2.88	3.19	3.50	3.52
May	2.91	3.50	3.91	3.92	3.75	2.69	3.11	3.03	3.44	3.38
June	2.73	3.28	3.53	3.90	3.75	2.53	3.05	2.87	3.44	3.39
July	2.53	2.96	3.22	3.83	3.72	2.36	2.81	2.81	3.44	3.42
August	2.61	3.09	3.04	3.91	3.73	2.47	2.86	2.84	3.50	3.43
September	2.92	3.19	3.11	3.94	3.75*	2.72	2.94	2.94	3.56	3.56*
October	2.73	3.19	3.20	4.02	....	2.65	2.94	2.97	3.64	....
November	3.16	3.19	3.44	4.06	....	2.94	2.97	3.19	3.74	....
December	3.36	3.31	3.67	4.13	....	3.24	3.10	3.41	3.81	....
Yearly Avg.	2.92	3.22	3.48	3.95	3.77‡	2.76	2.99	3.09	3.57	3.57‡

* Average for first half of month. ‡ January-August average.

demand during the season will be at least 2,000,000 barrels more than last year. Burners of the distillate type in use may increase from 1,350,000 to 1,650,000, which may be compared with 224,308 burners in use at the end of 1931. Since 1930 kerosine demand has increased 20,000,000 barrels annually to a total of 54,951,000 barrels in 1937.

Stocks Are Large

By way of preparation for the coming heating season, fuel oil stocks, including residual fuels, gas oil and distillate fuels, are now higher than at any time in the past five years and are probably now above 130,000,000 barrels by the Bureau of Mines method of computation, as compared with a 1937 high of 121,000,000 barrels last November. At the present rate of demand (last 12 months) this is nearly a four-months supply but at the October-to-December rate of demand of last year it would last about three and a half months.

Gas oil and distillate fuel stocks, estimated at 30,000,000 barrels, are less than two and a half months supply at last year's October-to-December rate of demand.

By the American Petroleum Institute's method of computation, which was started last January to include more California crude than before, stocks of all fuel oils Sept. 10 were up to 149,000,000 barrels. On this basis the supply would last somewhat longer for the heavy fuels.

Sinclair Is Building New Dewaxing Plant

NEW YORK, Sept. 20. — Construction of a benzol-ketone solvent dewaxing plant by the Lummus Co. for Sinclair Refining Co. at Wellsville, N. Y., was begun recently, Sinclair officials announce. This unit has a capacity of 3000 barrels of zero pour point lubricating oil per day and will be completed about the middle of January, 1939, it is stated. This plant replaces equipment recently destroyed by fire in the Wellsville refinery.

Perco Licensing Agent

NEW YORK, Sept. 19.—Perco, Inc., Bartlesville, Okla., has appointed Process Management, Inc., 120 E. 41st St. as licensing agent for the Perco copper sweetening process in the territory east of the Mississippi. This process has been adopted widely in the west where 70 or more installations have been built, replacing older type methods in most cases.

Calif. Must Cut 50,000 Bbls. To Hold Balance For Winter

N. P. N. News Bureau

LOS ANGELES, Sept. 17.—To keep supply and demand for crude oil in balance in coming months in California, it is indicated that the voluntary production quotas will have to be cut by about 50,000 barrels a day from their present levels of about 615,000 barrels.

The effort to achieve this by voluntary efforts — California has no proration statute around which such a program can be built—is further complicated by recent additions to the flush producing areas in the state and by indications of further additions. At the end of August, potential production from California fields was placed at about 1,834,000 barrels daily, higher than at any time since May, 1935.

To prevent abnormal additions to storage during the coming winter, it is believed that producers must curb their output in line with the seasonal decline in motor fuel consumption, even though improved demand eases heavy oil storage.

A study of Table 1, showing the relative position of various Pacific Coast petroleum stocks for the month-end of July, 1937, and 1938, points to an increase in total stocks of nearly 30,000,000 barrels during the year, nearly all of which is in the bracket of "fuel oils", which include non-gasoline bearing crudes, gas and diesel oil, and fuel oil.

Refinable crude stocks are approximately the same as a year ago and storage of gasoline is in line with the previous period considering that the figure of 16,356,000 barrels this year includes 1,377,000 barrels of naphtha distillate not included in the 1937 gasoline total.

Although stocks of "fuel oil" are admittedly too high, industry leaders point to the fact that most of this can be cracked and is easily stored, and that the overhanging surplus would be readily liquidated with a return to normal industrial activity, plus a colder winter.

Seven New Fields

Approximately 42 per cent of the state's total potential producing capacity is in seven newly discovered fields in the San Joaquin Valley, the Santa Maria Valley and the Wilmington field. These nine fields had an estimated potential of 764,842 barrels daily on August 1. Recent gusher-type completions in the San Joaquin Valley have added untold amounts to the state's reserves of high gravity crudes and widespread drilling activity in promising, and unproven areas in this territory indicate further additions before the year is out.

Within the past week, a third completion in the recently discovered Coalinga Nose field, which backs up to the north of Kettleman Hills North Dome, was estimated to have a productive capacity in line with the two previous completions, which were gauged at a rate of 20,000 barrels a day each.

While the San Joaquin Valley does not present any great hurdle to the curtailment program, this is not true in the Los Angeles Basin, where townlot operation continues to flourish.

Wilmington continues to present a problem with its potential production of nearly 500,000 barrels daily from 547 wells. The individual well potential is actually 880 barrels a day, although it is admitted the field could not produce the estimated total if every well were opened up.

Maximum allowable for any well in this field is 400 barrels daily, with indications this may be reduced to 300 barrels as drilling projects are completed.

With a production of 92,954 barrels on Sept. 14, the field was contributing 24,584 barrels to net excess production for the state.

However, this situation does not add materially to proration worries, as the production is not going to storage and the east coast shipments could be filled with no other California crude.

With half the state's production coming from major companies and with the greater part of the balance in the hands of producers conforming to the voluntary curtailment program, it is believed emergencies expected to arise in the next six months will be met without difficulty—provided there is an increase in fuel oil demand and refined oil consumption does not fall below anticipated levels.

Before going on to the demand analysis, some mention should be made of the current production record in California. On Sept. 14, all fields in the state produced 693,144 barrels, which compares with 695,144 barrels on the same day last year.

Set back by the early winter months, when inclement weather and the recession caused an abnormal decline in demand, Pacific Coast consumption of gasoline, however, is expected to finish out the year at the level, or perhaps slightly ahead of the record set for 1937.

At the end of August, consumption in this area for the eight months was estimated at approximately two per cent under the same 1937 period. However, oil industry economists believe demand over the next four months will be substantially ahead of last year.

TABLE 1

Stocks of Crude and Refined Petroleum in the Pacific Coast Territory

	July 31 1937	July 31 1938
Refinable Crude	32,548,000	32,995,000
Natural Gasoline	2,713,000	3,295,000
Fuel oil*	71,560,000	97,819,000
Gasoline†	13,922,000	16,356,000
Naphtha Distillate	1,759,000	.....
Other finished products	2,744,000	5,813,000
Misc. unfinished products	3,374,000	528,000
	128,620,000	156,806,000

* Includes non-gasoline crude, gas and diesel oil, and fuel oil.
† Naphtha distillate transferred to gasoline Dec. 31, 1937.
The 1938 figures show a revision effective December 31, 1937 in accordance with new Bureau of Mines specifications under which: 993,000 barrels were transferred from refinable crude to heavy crude. (fuel oil); 13,391,000 from fuel oil to heavy crude (fuel oil); 1,710,000 from miscellaneous unfinished to gas-oil (fuel oil); 1,358,000 barrels from unfinished to other finished.

Gravity Schedules Restored In Texas

HOUSTON, Sept. 19. — Humble Oil & Refining Co. today announced rescission of its revised crude oil price schedules made Aug. 29 which involved new postings for high gravity oil in the following Texas fields: Panhandle, Conroe, Tomball, Raccoon Bend (deep sand), Satsuma, Gillock, Cedar Point, Fairbanks, Anahuac, Dickinson, Turtle Bay and West Central Texas fields.

Gravity and price schedules in the above fields, effective today, will be identical with schedules posted prior to Aug. 29, the company said. (See NATIONAL PETROLEUM NEWS, Aug. 24.).

Schedules for Refugio and Mirando crudes are not affected by today's rescission order. Postings for oil in these two fields running as high as 50 gravity and above still are in effect, it was said.

More Fall And Winter Touring Is In Prospect

N. P. N. News Bureau

WASHINGTON, Sept. 19. — While poor weather and economic conditions combined to curtail motor touring this past summer season to a very slight degree, as compared with the record of 1937 vacation travel, an upturn in motor touring this fall and winter is foreseen by the various agencies here which keep in touch with the goings and comings of the American motorist.

Various reasons are advanced why increased motor touring may be expected in the months to come.

Some people who gave up their vacations this summer, due to the depression, are expected to make them up within the next few months as business conditions improve.

New England and some of the traditional summer touring districts this year had disagreeable weather conditions, causing some trips there to be postponed, or they will be taken to other points later.

It is also pointed out that the '38 summer was milder than normal in some population centers from which residents normally get away if possible during the hot months. Some vacation trips remain untaken here.

Probably the most important reason cited by the American Automobile Assn. for postponed vacations this year, however, is the desire to see one of the two World's Fairs scheduled for 1939, one in San Francisco and one in New York. The San Francisco fair opens Feb. 18 and the New York fair April 30. Both are expected to stimulate long-distance motor travel, combining cross country sightseeing with visits to the expositions.

More Short Trips

The advertising campaigns which various states have initiated to attract tourists, too, are having their effect upon citizens of the states themselves, and it is said the number of "intra-state" travelers for pleasure is growing annually.

These trips to points of interest in the home state or neighboring states will be taken not only by this fall's new "short trippers" who for one reason or another have foregone their long vacation during the peak season, but also by families who have already had their long vacations, thus swelling the autumn and winter total, says the American Automobile Assn.

Frolich Heads Oil Chemists

MILWAUKEE, Sept. 20. —Dr. Per K. Frolich, research director for Standard Oil Development Co. (Standard of New Jersey), has been elected chairman of the petroleum division of the American Chemical Society, succeeding Dr. J. C. Morrell, Universal Oil Products Co., chairman for the year just ended.

Joseph K. Roberts, research director of Standard of Indiana, is the new vice-chairman. Dr. C. R. Wagner, chief chemist of Pure Oil Co., was re-elected secretary-treasurer, with J. C. Morrell and Frank W. Hall, the latter research director for The Texas Co., as directors of the division.

New York Price Law Comes Before Court

N. P. N. News Bureau

NEW YORK, Sept. 20. — Contracts specifying minimum retail prices on branded gasolines under New York's fair trade law will be given their first court test Sept. 21 when argument of a "show cause" order comes up before Brooklyn Supreme Court Justice May, according to Charles J. Bensky, counsel for Petroleum Dealers Chamber of Commerce, which, along with another dealer, is seeking an injunction against a retailer accused of selling at less than the price specified by the supplier.

N. A. P. R. Program Lists New Speakers

CLEVELAND, Sept. 20. — Augmenting the already full and imposing program for the sixth annual convention of the National Assn. of Petroleum Retailers to be held Sept. 27-29 at the Jefferson Hotel, St. Louis, will be three more speakers.

S. B. Magill, lubrication engineer, will speak on "The Sales Approach From the Island." Other speakers will include H. B. Mathews, of the Commercial Credit Co., and Phillip P. Gott, of the trade association division of the U. S. Chamber of Commerce.

A School of Marketing, conducted by Profs. C. E. Willard, I. D. Anderson, and L. A. Bosch, will include three lectures, one each on association activity, record keeping and control, and balanced selling and effective merchandising.

Cut-Price Crude Amounts To 18,000 Barrels Daily

N. P. N. News Bureau

TULSA, Sept. 20.—An estimate, probably conservative, is that about 18,000 barrels daily of crude are being purchased in Oklahoma and Kansas at prices under the schedules of major buyers. The average price on this oil would be about 15 cents per barrel under the postings prevailing on the bulk of the production.

Additionally, there is reported to be about 1700 barrels daily in North Texas being purchased and processed at 15 and 20 cents under schedules of the dominant buyers.

Some East Texas oil, recently estimated at about 8000 barrels daily, is being obtained by local refiners at less than the posted price. Most of this however, is weathered crude and fuel oil, acquired through confiscation proceedings brought by the state, and does not have the yield value of fresh crude. Built up prices on this, taking into account the various costs besides the acquisition price, are said to range from 50 to 75 cents per barrel.

East Texas Not Included

Not included in the category of under-prevailing-price crudes is the Arkansas and North Louisiana production that has displaced considerable East Texas crude recently. While the price was such as to make these crudes desirable, even for refining in the East Texas field, the actual posted price is being paid for it. The principal crudes that have competed in East Texas recently are Schuler, Arkansas, and Lisbon, La., posted respectively at 85 and 98 cents. Some of their advantage was removed when East Texas, long considered by some buyers to be out of line with other crudes, was recently reduced 10 cents to $1.25.

A very small amount of K.M.A. crude has moved at less than the posted price, but the volume never reached substantial proportions.

One price reduction was added this week to the rather extensive list of "local' adjustments that began last May. Standard Oil Co. of Louisiana posted a price of 75 cents a barrel on Smackover, Ark., crude, a reduction of 15 cents. It became effective Sept. 15. Similar reductions were made the next day by The Texas Co. and Magnolia Petroleum Co.

Production of this field, a sensation 15 years ago, is now around 18,000 barrels daily. Formerly purchased as light (25-32°) and heavy (17-25°) the oil has been bought on a flat price for several years. The field's output is bought by several companies in addition to the three who made the reductions.

The Standard company termed the change an adjustment. Posted price of Schuler field crude, a higher gravity oil than Smackover, is 85 cents and it is competitive with Smackover.

Some Excess Oil

Elsewhere the price structure showed no change. Some observers saw a betterment of conditions because of the reduction in crude output in Texas, brought about by the Saturday shutdown. There are, however, some spots where market outlet is below the amount of oil being produced there. This condition obtains in several southern Oklahoma pools, in East Texas and in western Kansas.

In the last named area Phillips Petroleum Co. is taking 85 per cent of the current allowable production through September. The Kansas Corporation Commission called representatives of the purchasing companies to meet in Topeka Sept. 13 and see what could be done about taking up the approximately 3500 barrels which is the difference between Phillip's requirements and the allowable from the connections affected by the reduction. No other purchaser offered relief. Generally, they said they were either taking all they could use or were running some crude to storage. The problem was left unsolved.

The purchasers nominations to buy, or forecast of requirements, given to the commission in August, totalled about 155,000 barrels from Kansas. The commission fixed the allowable at 165,500 barrels, which was 2500 barrels under the Bureau of Mines forecast of demand for Kansas crude.

Refinery To Suspend

Between 41,000 and 42,000 barrels per month are being turned back to producers Oct. 1 by Eason Oil Co., Enid, Okla., which has notified owners of wells to which its gathering lines connect it will suspend operation of its Enid refinery on

that date. Since February, when fire destroyed cracking equipment at the plant, its operation has been on skimming plant basis. This, the company says, is not economic. The affected production is in the Garber, Crescent and Lovell pools of north central Oklahoma, most of it owned by major companies.

In the K.M.A. field, in Wichita and Archer counties, Texas, where purchasers are buying less than the allowable set by the Texas Railroad Commission, producers were hopeful a new market would develop. Hope Engineering Co., nationally known construction company, has had representatives in the field for several weeks looking into the feasibility of laying a pipeline to the Gulf Coast.

The company, through B. E. Hepler, president, made a concrete proposal to producers this week at a meeting in Wichita Falls. If producers would sign five-year contracts covering 10,000 proved acres, Hope would lay an eight-inch line; a 10-inch line if 12,000 acres were signed. The company would pay the posted price for the crude.

Acreage Is Pledged

Last reports were that something over 8000 acres had been pledged and the rest of the amount of required acreage was believed to be in sight. There is a little element of mystery about the project. The Hope has not heretofore engaged in the business of buying and selling crude oil nor in operating crude oil lines, although it is experienced in the operation of natural gas systems. The opinion is ventured by some that Hope is backed by some other company not yet ready to disclose its identity. Admittedly, this speculation is based upon nothing more than the fact that Hope's principal business is engineering and construction.

Whatever it is, K.M.A. seems closer this week to new outlet for its oil than it yet has been. The Hope company never indulges in idle talk. It is well known in the industry. For years it manufactured engines and compressors at Mount Vernon, O., but with the sale of its plant there, it has concentrated on several phases of engineering and construction.

More Orphan Wells

In the East Texas field the number of wells without connections has increased and was reported at 86 at the end of the week. Some of these are new ones, brought in since the recent distress period when upward of 500 lacked market for a few days. Some others make little oil and much water and are not desirable from a pipeline standpoint.

In this same field the confiscation of "hot" oil continues to be a prominent subject. A public sale of 122,000 barrels of confiscated oil at Henderson Sept. 16 is being protested by Attorney General McCraw, who brought the original suit whch led to the sale. His protest is on the price and he asserted he would ask the court to set aside the sale. The oil was 34° gravity, he said, and sold for 30 cents per barrel. Another sale of 82,000 barrels set for Tyler the same day was postponed because of the low price at Henderson.

Another sale has been set for Nov. 4 at Longview. This calls for the auction of 173,824 barrels of oil held in four pits in Gregg county. It is fuel oil, ranging in gravity from 17 to 23°.

It is estimated that about 8000 barrels daily of oil other than fresh crude is being processed in East Texas plants. Confiscated oil, topped crude and oil cleared by the courts and declared legal make up this amount.

Crude Price Changes

NEW ORLEANS — Effective Sept. 15 Standard Oil Co. of Louisiana reduced Smackover, Ark. crude 15 cents, to new price of $0.75 per barrel at the well. Last previous change was a 15 cent advance Jan. 28, 1937.

Other major purchasers meeting this price were: Magnolia Petroleum Co. and The Texas Co., both on Sept. 16.

TULSA — Effective Sept. 15 Stanolind Oil & Gas Co. reduced prices in Evangeline field, Acadia Parish, La. in amounts ranging from 8 to 16 cents. Its new prices range from $1 per barrel for oil 31 degrees and below, plus 2 cent differential for each higher degree, to top grade of 40 and above at $1.18. Its gravity schedule formerly began with below 20 at $0.92 with 2 cent differential to top grade of 40 and above at $1.34.

BARTLESVILLE, OKLA. — Effective Sept. 17 Phillips Petroleum Co. met the 15 cent reduction on Smackover, Ark., previously posted by other major purchasers, making its new price $0.75 per barrel.

Lisbon Crude Cut

SHREVEPORT, La., Sept. 20. —Caddo Crude Oil Purchasing Co. (Grogan Oil Co. subsidiary) today announced a revised crude oil price schedule for Lisbon (north Louisiana) crude which reduces prices 6 to 10 cents per barrel below the company's former flat-price posting of 98 cents.

A price of 88 cents was posted for below 34 gravity oil, 90 cents for 34-34.9 gravity, and 92 cents for 35 gravity and above.

A. P. I. Group will Discuss Public Relations Program

N. P. N. News Bureau

NEW YORK, Sept. 19. — A program of public relations, both within the oil industry and on the part of the industry with the public, will be informally discussed at a meeting at the Stevens Hotel, Chicago, Sept. 26, of the newly organized committee on public relations of the American Petroleum Institute.

The new committee, of which W. S. Rodgers, of New York, president of the Texas Company, is chairman, replaces the former public relations advisory committee of the institute, of much smaller membership, which has not functioned in an active way.

Mr. Rodgers also will serve as chairman of the public relations steering committee, the first of a number of sub-committees to be appointed from membership in the general committee and from various branches of the industry.

The committee as now constituted comprises 27 members and it will be enlarged to include one representative from each of as many companies as possible within the industry.

The public relations steering committee is to be composed of a smaller group of oil company public relations counsel, which would receive and act upon the recommendations of the larger committee, act as liaison between the committees and the institute's executive committee and board of directors and would have charge of putting public relations policies into effect.

Will Be Expanded

Work of expanding the larger committee is to be carried on at present by President Axtell J. Byles and Vice-president W. R. Boyd, Jr., of the institute.

It was explained here that eventually sub-committees, each representing a group activity of the industry would be appointed to permit direct contact with all industry activities in all sections of the country and the solution of local problems. It has been suggested that such sub-committees include production, refining, transportation, marketing, natural gas, equipment, advertising, industrial relations and personnel, accident prevention, house organ editors, trade press publishers and petroleum trade associations.

No definite plan of action has been worked out as yet but it was indicated the committee would first concern itself more with relations within the industry than on any program of relations with the general public.

List of Members

Members of the committee on public relations so far appointed are:

Paul V. Barrett, The Ohio Oil Co., Findlay, O.; Paul G. Blazer, Ashland Refining Co., Ashland, Ky.; Ralph C. Champlin, Ethyl Gasoline Corp., New York; James A. Dunn, Barnsdall Oil Co., New York; W. R. Francisco, Deep Rock Oil Corp., Tulsa, Okla. A. C. Galbraith, Union Oil Co. of California, Los Angeles, Calif.; and D. W. Grant, Pennzoil Co., Oil City, Pa.

Eben Griffiths, Socony-Vacuum Oil Co., Inc., New York; Walter R. Haun, Lion Oil Refining Co., Eldorado, Ark.; C. L. Henderson, Vickers Petroleum Co., Wichita, Kans.; C. C. Herndon, Skelly Oil Co., Tulsa; Allan Jackson, Standard Oil Co. (Indiana), Chicago; Francis L. Jehle, Globe Oil & Refining Co., Wichita; Roy B. Jones, Panhandle Producing & Refining Co., Wichita Falls, Texas; R. C. Jopling, Phillips Petroleum Co., Bartlesville, Okla.; and E. B. Lyman, Standard Oil Co. (New Jersey), New York.

Ray E. Miller, Hanlon-Buchanan, Inc., Tulsa; George D. Olds, Continental Oil Co., New York; H. F. Parsons, Tide Water Associated Oil Co., New York; Philip Patchin, Standard Oil Co. of California, San Francisco, Calif.; T. D. Peace, Shell Union Oil Corp., New York; D. T. Pierce, Consolidated Oil Corp., New York; and Richard Rollins, The Atlantic Refining Co., Philadelphia.

Paul Ryan, Pure Oil Co., Chicago; H. A. Schramm, Kanotex Refining Co., Arkansas City, Kans.; George H. Shaw, Cities Service Co., New York; James A. Tanham, The Texas Co., New York; and W. K. Warren, Warren Petroleum Co., Tulsa.

Kansas Gas Pipeline Seeks FPC Permit

N. P. N. News Bureau

TULSA, Sept. 19. — Another step in the proposed natural gas pipeline from southwestern Kansas fields to Minnesota was taken recently when the Kansas Pipe Line and Gas Co. asked the power commission at Washington for permission to construct a $21,470,000 line. The company previously has asked the R.F.C. for a $20,000,000 loan to finance the project.

October Motor Fuel Demand Set One Per Cent Over '37

By Teletype
N. P. N. News Bureau

WASHINGTON, Sept. 20.—The Bureau of Mines today estimated October motor fuel demand as 45,800,000 barrels, a gain of 1 per cent over October demand last year. However, anticipating a "substantial decline in gasoline stocks for the month", the bureau forecast the daily average supply of domestic crude oil to meet October requirements at but 3,366,800 barrels, 7 per cent under actual demand for domestic crude in October, 1937.

In forecasting the motor fuel demand, the bureau commented that the total demand for the first seven months of 1938 "ran slightly under the record of 1937, but this situation was due entirely to the poor record of July 1938."

"Indications are," the bureau added, "that the demand in August, 1938, was at least equal to that in August, 1937, and that by October business recovery will have progressed enough to show a gain in demand over the previous year."

Exports of motor fuel have been estimated as 4,400,000 barrels, the same as for September, making total estimated demand 50,200,000 barrels.

Stocks To Be Cut

The bureau estimates a reduction of 1,900,000 barrels in finished gasoline stocks in October, pointing out that, on Aug. 31, stocks of 71,000,000 barrels were between 4,000,000 and 5,000,000 barrels above the level of last year.

"Regardless of what happens to these stocks in September," the bureau says, "it is obvious that there is no need of repeating the accumulation of October, 1937. Rather, there is every reason for feeling that some of the excess will be liquidated this October, the last month for which it is reasonable to expect a reduction."

Benzol and direct sales and losses of natural gasoline have been estimated as 1,000,000 barrels, making estimated refinery production to meet the demand 47,300,000 barrels. This is distributed among the refining districts as follows:

District	Thousands Barrels
East Coast	6,220
Appalachian	1,650
Indiana-Illinois	8,240
Oklahoma	2,870
Kansas	2,680
Inland Texas	3,720
Texas Gulf Coast	11,980
La. Gulf Coast	1,510
N. La.-Arkansas	910
Rocky Mountain	1,110
California	6,410
TOTAL U. S.	47,300

The bureau estimates further that natural gasoline consumption at refineries in October will account for 8.7 per cent of total production, compared with 8.5 in October last year. Yield of straight-run and cracked gasoline, which rose to 44.7 per cent in July, is estimated at 44.4 per cent for October. Application of this yield to the straight-run and cracked production estimated, gives crude runs of 97,320,000 barrels, or 3,139,000 barrels daily.

A decline in exports of crude oil in October is anticipated, and exports of 7,000,000 barrels are estimated, "pending developments in European trade", which, of course, means unless war demands raise the total.

October Crude Demand

Allowing for increased consumption of crude as fuel as fall approaches, the bureau arrives at a total estimated demand for crude in October of 104,370,000 barrels, or 3,366,800 barrels daily. This is 77,500 barrels less than the September estimate and 211,000 barrels below actual production in October, 1937.

The total estimated market demand for crude is broken down by states of origin as follows:

	Barrels Daily
Texas	1,359,000
California	619,000
Oklahoma	523,600
Louisiana	248,400
Kansas	163,400
New Mexico	109,200
Wyoming	69,700
Arkansas	54,100
Michigan	53,900
Illinois	51,900
Pennsylvania	44,300
Kentucky	16,100
New York	14,300
Montana	13,800
West Virginia	10,100
Ohio	9,100
Colorado	4,300
Indiana	2,600
TOTAL	3,366,800

Virginia Oil Men To Meet Oct. 5-6

RICHMOND, Va., Sept. 19.—Virginia Oil Men's Association will hold its annual fall meeting October 5 and 6 at the Patrick Henry Hotel, Roanoke, McC. Higgins, Higgins Oil Co. of Galax, association president announces.

Independent oil jobbers will hold their meeting on the night of October 5, with the Virginia Oil Men's Association, which is composed of both major company officials independents, holding its regular sessions the following day, climaxed by the banquet, dance and entertainment.

Latest Daily Crude Oil Production, Important Districts and Total U. S.

(American Petroleum Institute figures)

	Week Ended Sept. 17	Week Ended Sept. 10	Week Ended Aug. 13
	Barrels	Barrels	Barrels
Oklahoma City	105,250	107,100	116,450
Total Oklahoma	446,800	447,500	439,600
Kansas	167,050	154,300	165,200
East Texas	368,500	368,350	440,500
Total Texas	1,214,750	1,210,650	1,387,850
Total Louisiana	266,500	271,100	256,000
Illinois (New pools)	67,050	67,450	46,200
California	683,400	664,600	669,200
East of Rockies	2,555,650	2,542,300	2,690,700
Total U. S.	3,239,050	3,206,900	3,359,900
Crude Imports	94,571	28,140	81,570
Total New Supply	3,333,621	3,235,040	3,441,470

5000 Dealers Sign Philadelphia Plea On Fair Trade Law

N. P. N. News Bureau

NEW YORK, Sept. 17.—Precipitated by the severe retail price war which has been raging among them for the past month or more, dealers in the Philadelphia area have sent in over 5000 petitions, asking that their suppliers place their retail gasoline operations under the Pennsylvania fair trade act, to the Metropolitan Philadelphia Association of Petroleum Retailers.

"After seeing how the fair trade act of New Jersey has stood the acid test", the dealer association stated, "it is becoming more and more convincing to the dealers of this state and in particular the eastern part of Pennsylvania that this is the start of the answer to the market problem."

The association statement points out how New Jersey has stood up with a 15.9 cent price, while most of the eastern part of Pennsylvania, which borders New Jersey, has been selling at 11.5 cents and up.

A.T.A. Asks Rules Suspension

N. P. N. News Bureau

WASHINGTON, Sept. 19. — American Trucking Associations, Inc., representing truckers of virtually all kinds of commodities in all parts of the country, have filed with Interstate Commerce Commission a petition asking that the effective date of the "hours of service" rules for contract and common carriers recently promulgated for truck drivers, Oct. 1, be indefinitely postponed.

Crude Stocks Down 2,462,000 Bbls.

By Teletype
N. P. N. News Bureau

WASHINGTON, Sept. 20. — Reporting a 2,462,000-barrel decline in refinable crude stocks during the week ended September 10, Bureau of Mines today pointed out that during the week in question crude runs to stills exceeded production for the first time in several months. Renewal of Saturday shutdowns in Texas were charged with a share in the decreased production.

The decline brought stocks on September 10 to 282,457,000 barrels, compared with stocks of 298,448,000 barrels on September 12, nearest comparable date in 1937.

Stocks by grade or origin, showing changes, follow:

Grade or Origin	Sept. 3	Sept. 10	Change
	(Thousands of barrels)		
Pennsylvania Grade	6,159	6,211	+ 52
Other Appalachian	1,412	1,370	— 42
Lima-Michigan	1,251	1,211	— 40
Illinois-S. W. Indiana	10,699	11,011	+312
Arkansas	3,048	2,906	—142
Kansas	6,265	6,239	— 26
Louisiana	13,829	13,733	— 96
Northern	6,053	6,008	— 45
Gulf Coast	7,776	7,725	— 51
New Mexico	7,624	7,350	—274
Oklahoma	78,599	77,636	—963
Texas	97,699	96,920	—779
East Texas	24,425	23,520	—905
West Texas	17,926	18,247	+321
Gulf Coast	20,360	20,018	—342
Other Texas	34,988	35,135	+147
Rocky Mountain	22,248	22,163	— 85
California	33,309	33,244	— 65
Foreign	2,777	2,463	—314
Total U. S. Refinable	284,919	282,457	—2,462
Heavy in California	17,562	17,501	— 61

Oil Statistics at a Glance

CRUDE PRODUCTION: U. S. daily average output increased 32,150 barrels in week ended Sept. 17 but continued at rate approximately 200,000 barrels below Bureau of Mines estimate of September demand, and 430,000 barrels below output at this time last year.

CRUDE STOCKS: Drop 2,462,000 barrels in week ended Sept. 10.

CRUDE RUNS TO STILLS: In week ended Sept. 17 averaged 3,245,000 barrels daily, up slightly from previous week, but 245,000 barrels below level of year ago.

GASOLINE PRODUCTION: Cut 146,000 barrels at plants reporting to A.P.I.

GASOLINE STOCKS: Resumed downward trend, dropping 1,616,000 barrels to below 70,000,000-barrels mark on Sept. 17.

GAS & FUEL OIL STOCKS: Showed smallest increase in several months; light fuel stocks up; heavy fuels down.

U. S. Gasoline Stocks Drop Below 70,000,000 Barrels

N. P. N. News Bureau

NEW YORK, Sept. 20.—Gasoline stocks in the U. S. resumed their downward trend in the week ended Sept. 17, dropping 1,616,000 barrels to below 70,000,000 barrels, according to report of the American Petroleum Institute today.

Refinery crude runs were increased slightly and gas and fuel oil stocks showed the smallest increase in several months, the Institute's report also showed.

Gasoline stocks on Sept. 17 totaled 69,244,000 barrels, only 3,268,000 barrels above stocks on Sept. 17, 1937, and the lowest since the end of November last year. At this level stocks had declined 23,948,000 barrels, or 25.7 per cent, from the 1938 peak reached in March.

Compared with last week's withdrawals from storage of 1,616,000 barrels, the Institute's report shows a decline of only 321,000 barrels in inventories in the Sept. 10-17, 1937 period.

Four refinery districts reported additions to gasoline inventories last week, the combined increase totaling 153,000 barrels. On the other hand, East Coast inventories alone declined 1,129,000 barrels, and Oklahoma-Kansas-Missouri and Indiana-Illinois-Kentucky inventories were down 290,000 barrels and 160,000 barrels, respectively.

Gasoline production at plants reporting to the Institute was cut 146,000 barrels, compared with a stocks reduction of 1,616,000 barrels, indicating demand exceeded output by 1,470,000 barrels.

There was a slight increase in production in the Louisiana-Gulf and Rocky Mountain districts and California output increased 113,000 barrels. All other districts reported curtailed production with East Coast and Texas-Gulf each down 103,000 barrels.

Gas and fuel oil stocks increased 284,000 barrels last week. Inventories of the gas oils and distillates were up 418,000 barrels, while heavy fuel inventories were reduced 134,000 barrels. Notable declines in heavy fuel stocks were 270,000 barrels in the Texas-Gulf district, and 243,000 barrels in California.

Distillate Burner Shipments Up

WASHINGTON, Sept. 19.—A total of 31,789 distillate oil burners was shipped in July, Census Bureau reports, more than doubling June shipments which amounted to 15,018 burners. However, only 92,777 burners have been shipped so far this year as compared with 144,145 for same period in 1937 and 105,215 during 1936. The Census Bureau points out that statistics for 1938 include data from only 76 manufacturers, while 82 reported in 1937 and 1936.

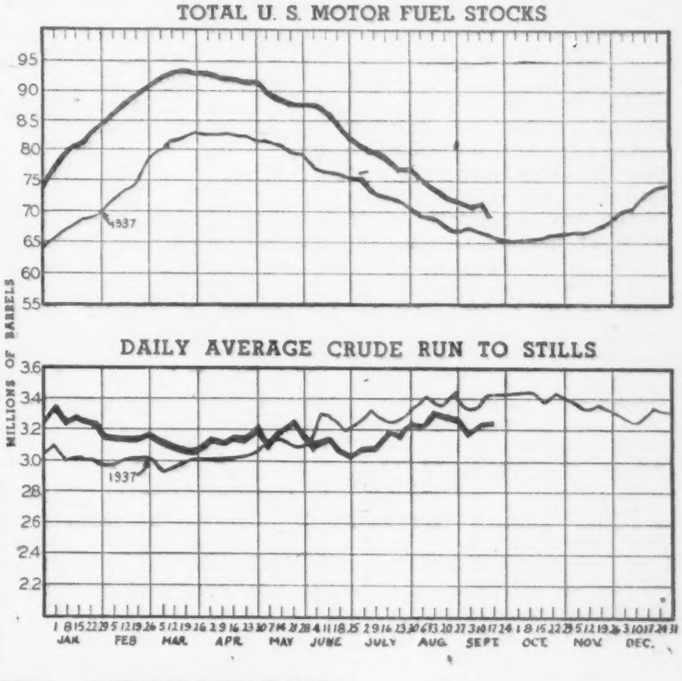
Tulsa Oil Auctions To Be Held Monthly

N. P. N. News Bureau

TULSA, Sept. 19.—The recently organized Auction Board of Trade, headed by Earl Sneed, trustee of the Sneed Royalty Co. of Tulsa, will hold the first of its monthly auctions Sept. 30 at Tulsa convention hall. Oil and gas properties, fee lands and royalties are to be sold. Col. E. Walters of Skedee, Okla., who has been auctioning oil properties for the past 30 years, will be auctioneer.

CORRECTION

In the article appearing on page 28 of the Sept. 7th issue of NATIONAL PETROLEUM NEWS, entitled, "Special Equipment Lowers Cost of Bottled Gas to Consumers", the connection of M. G. Farrar was erroneously given. He is connected with the Carbide and Carbon Chemicals Corp. of New York.



CURRENT REFINERY OPERATIONS

(Figures in Thousands of Barrels of 42 Gallons Each)

Districts	Per Cent Capacity Reporting	Daily Average Crude to Stills, Week Ended		Per Cent of Reporting Capacity Operated, Week Ended		(a) Gasoline Production, Week Ended		Stocks Total Finished and Unfinished Motor Fuel(b), Week Ended		Stocks of Gas and Fuel Oil: Gas Oil and Distillates, Week Ended		Stocks of Gas and Fuel Oil: Residual Fuel Oil, Week Ended		Total, Week Ended	
		Sept. 17	Sept. 10	Sept. 17	Sept. 10	Sept. 17	Sept. 10	Sept. 17	Sept. 10	Sept. 17	Sept. 10	Sept. 17	Sept. 10	Sept. 17	Sept. 10
East Coast	100.0	477	471	77.6	76.6	1,470	1,573	18,502	19,631	6,926	6,765	8,462	8,333	15,388	15,098
Appalachian	85.9	103	103	80.5	80.5	371	386	2,895	2,988	232	226	743	750	975	976
Ind., Ill., Ky.	89.0	442	420	90.9	86.4	1,781	1,805	10,390	10,550	3,738	3,734	5,612	5,604	9,350	9,338
Okla., Kans., Mo.	81.6	267	274	78.1	80.1	1,031	(c)1,048	6,123	6,413	1,178	1,180	3,330	3,305	4,508	4,485
Inland Texas	50.3	120	118	75.5	74.2	497	510	1,672	1,732	369	366	1,651	1,601	2,020	1,967
Texas Gulf	88.9	737	766	87.9	91.4	2,369	2,472	10,188	10,156	5,696	5,694	7,778	8,048	13,474	13,742
La. Gulf	97.3	125	142	86.2	97.9	323	292	2,168	2,084	1,103	1,166	2,205	2,096	3,308	3,262
No. La., Ark.	55.0	36	44	65.5	80.0	105	122	533	519	285	282	603	597	888	879
Rocky Mt.	54.2	48	43	75.0	67.2	226	224	1,182	1,219	124	127	720	711	844	838
California	90.0	555	528	74.5	70.9	1,608	1,495	12,041	12,018	10,620	10,323	84,873	85,116	95,493	95,439
Total Reporting	85.5	2,910	2,909	81.4	81.3	9,781	9,927	65,694	67,310	30,271	29,863	115,977	116,161	146,248	146,024
Estimated U. S. Total (Bur. of Mines)		3,245	3,235					69,244	70,860	30,991	30,573	118,397	118,531	149,388	149,104

(a) Includes straight-run, cracked, and natural blended.
(b) Includes stocks at refineries, in bulk terminals, pipe lines and in transit.
(c) 12% of reporting capacity in this district did not report gasoline production.

Handling Oil Safely Is Topic Of Papers At Safety Congress

CHICAGO, Sept. 20. — "The Safe Use of Petroleum Products" will be a featured part of the petroleum group's program during the Silver Jubilee Safety Congress and Exposition of the National Safety Council Oct. 10-14 at the Stevens Hotel here.

On the final day of a complete week of petroleum safety topics, the petroleum group will sponsor a general session covering the safe use of petroleum products, the program being as follows:

"Safety in the Transportation, Storage, and Distribution of Liquefied Petroleum Gas", by D. W. Cook, Philgas Dept., Phillips Petroleum Co., Detroit.

"Safety in Domestic Use of Liquefied Petroleum Gas (Illustrated)", by J. Woodward Martin, Lone Star Gas Co., Dallas, Texas.

"Safety in the Handling of Volatile Liquid Petroleum Products (Demonstration)", by John T. Howell, Union Oil Co. of California, Los Angeles.

The Congress will be accompanied by more than 130 exhibits, both commercial and contributive, including displays and many working demonstrations.

H. W. Boggess of Tulsa, Sinclair Prairie Oil Co., is general chairman of the petroleum division, and H. N. Blakeslee, head of the department of accident prevention of the American Petroleum Institute, New York, is secretary.

Van Senden Retires From Shell Service

LOS ANGELES, Sept. 20.—F. S. Clulow has been appointed vice president in charge of manufacturing of the Shell Oil Co., to succeed G. H. van Senden, who has retired after 23 years of service to the company, according to a company announcement.

Mr. van Senden came to Shell in 1915 as superintendent of the Martinez refinery, and continued with Shell Oil until 1933 when he went to New York as vice president of the Shell Union Oil Corp. to co-ordinate refining activities of the Shell operating companies.

In 1935 van Senden returned to the west coast to resume his former post of vice president of Shell Oil.

Mr. van Senden will reside at Carmel Highlands near Monterey and will lecture at the Stanford University School of Business.

Mr. Clulow, the new vice president, joined Shell in 1920. After preliminary experience he was made assistant superintendent of Martinez refinery and continued there for several years. Later he was made manager of the East Chicago refinery of Shell Petroleum Corp. He returned to the west coast in January of this year.

DEATHS

Max Fuhrman

TULSA, Sept. 17. — News of the death of Max Fuhrman, formerly an oil producer in the Okmulgee and later in the West Texas districts, on Sept. 14 reached friends in the Mid-Continent. He fell to his death from the 10th story of a San Francisco hotel. He was 42 years old and had suffered for several years from a fever contracted in South America, apparently caused by insect bite. His three companions on that trip were similarly affected and have since died.

Fuhrman came to Okmulgee in 1919 and organized the Fuhrman Petroleum Co. In 1930 the company sold its Oklahoma properties to the Transcontinent Oil Co. for a reported price of $1,400,000. The company moved to Midland, Tex., and is still operating in that area. Fred Fuhrman, a brother, is the president of the company. Other survivors are the mother, Mrs. Rita Fuhrman, and a sister, Mrs. Paula Vogel, also of Midland.

George B. Ray

DALLAS, Sept. 17. — George B. Ray, 60, independent producer in Texas, died Sept. 15 in a Dallas hospital. He began in the producing business at Wichita Falls. He operated in the East Texas field in partnership with R. H. Venable and W. L. McClanahan. He is survived by his widow and two sons, George F. and John H. Ray.

G. C. Wright

TULSA, Sept. 17. — Gerden C. Wright, chief clerk of the Oklahoma Pipe Line Co., died Sept. 14 at his home in Tulsa. He was 47 years old. He left his widow, one daughter and one son.

E. C. D'Yarnett

OKLAHOMA CITY, Sept. 17. —E. C. D'Yarnett, 62, oil operator, died in Oklahoma City, Sept. 14. He was a resident of Tulsa. His widow and one son, W. E. D'Yarnett, survive him.

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Power Alcohol Powerless For the Present

By Arch L. Foster, N. P. N. Technical Editor

Production of power alcohol as a national movement is entirely impractical and the motor fuel situation does not warrant any such effort, Burke Jacobs told the American Chemical Society at Milwaukee two weeks ago. Jacobs is senior chemist with the U. S. Bureau of Chemistry and Soils, in charge of the survey of the power alcohol problem, and the survey is completed, awaiting publication by the Printing Office under a "super-rush" order.

Jacobs' presentation of the important findings of this survey, given in a city where a goodly portion of the nation's grain is converted into beverage alcohol, is the most significant study yet made in this country on this subject, the "political mathematics" of which has deluded a considerable portion of our farm and business population. Frankly, the bureau started out to find out the facts about the power alcohol movement. Any fact-finding effort is a debunking effort, and the bureau, feeling rightly that its sole job was to discover truth and falsity for the good of the whole nation, proceeded to do just that.

Alcohol will cost more than gasoline from petroleum, the investigators determined; that extra cost "must be met", Jacobs stated. What he failed to state, but what was clearly indicated in the context and the conclusions, is that this extra cost must be in the form of a subsidy, either by consumers paying a higher price for power alcohol blends, or by government aid such as a remission of taxes or other subterfuge.

No need is indicated so far for a replacement of fuels or sources of fuels, Jacobs said. Nor could he say whether such would be the case in ten, twenty or fifty years. Power alcohol has been advocated in this country as a farm relief and crop-raising scheme and not as a conservation measure. Such schemes bring complications into the situation, Jacobs declared. He stated a principle which should become axiomatic in the thinking of every technologist, business executive and political leader. "Agricultural materials should not be substituted in industry at the expense of raw materials now used," he said, and a careful observance of that principle will show the fallacy of any scheme which any political mountebank may attempt to foist on the nation for the "aid" of the "peepul".

The cheapest source of additional fuel supplies is doubtless the conversion of waste hydrocarbon gases in the petroleum industry, these investigators decide, a real conservation measure which the refining industry is already utilizing on a large scale. Just two weeks ago in these pages was published for the first time a description of a relatively low-cost process for dehydrogenating paraffin hydrocarbons such as propane and butane, the first step in their conversion to gasoline, or for the synthesis of innumerable chemical products. Commercially practicable processes for utilization of the stupendous quantities of natural gas now wantonly wasted would reduce the consumption of liquid petroleum by one-third or more, it has been estimated.

Furthermore, the bureau surveyors conclude definitely that any widespread use of farm crops to make power alcohol would result in a price increase for those crops to an extent which would make the price of the alcohol absolutely prohibitive.

Keep in mind that this bureau has as its primary interest the welfare of the farm and that it would make no attempt to cry down any movement which is economically capable of improving the farmer's status. Its findings can be taken as those of an unbiased group of competent technologists, bent only on discovering the truth and exploding fallacies. The results of this survey should bury the power alcohol Frankenstein as a general proposition for many decades to come, until such time as petroleum reserves are approaching the vanishing point. When that time will come, no human being can intelligently forecast.

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New Refrigeration Process Recovers Natural Gasoline at Low Cost—by D. W. Wilson . . R-458

Gasoline recovery system based on propane refrigeration and low compression pressures dehydrates natural gas, recovers natural gasoline, and concentrates propane-butane fractions.

Car Adjustment Large Factor in Anti-Knock Requirements—by R. J. Greenshields, L. E. Hebl and T. B. Rendel R-464

High compression in automotive engines gives better part-throttle economy; little change in octane number requirements of cars has taken place during last six years. Cars in any locality become adjusted to the gasoline available in that locality.

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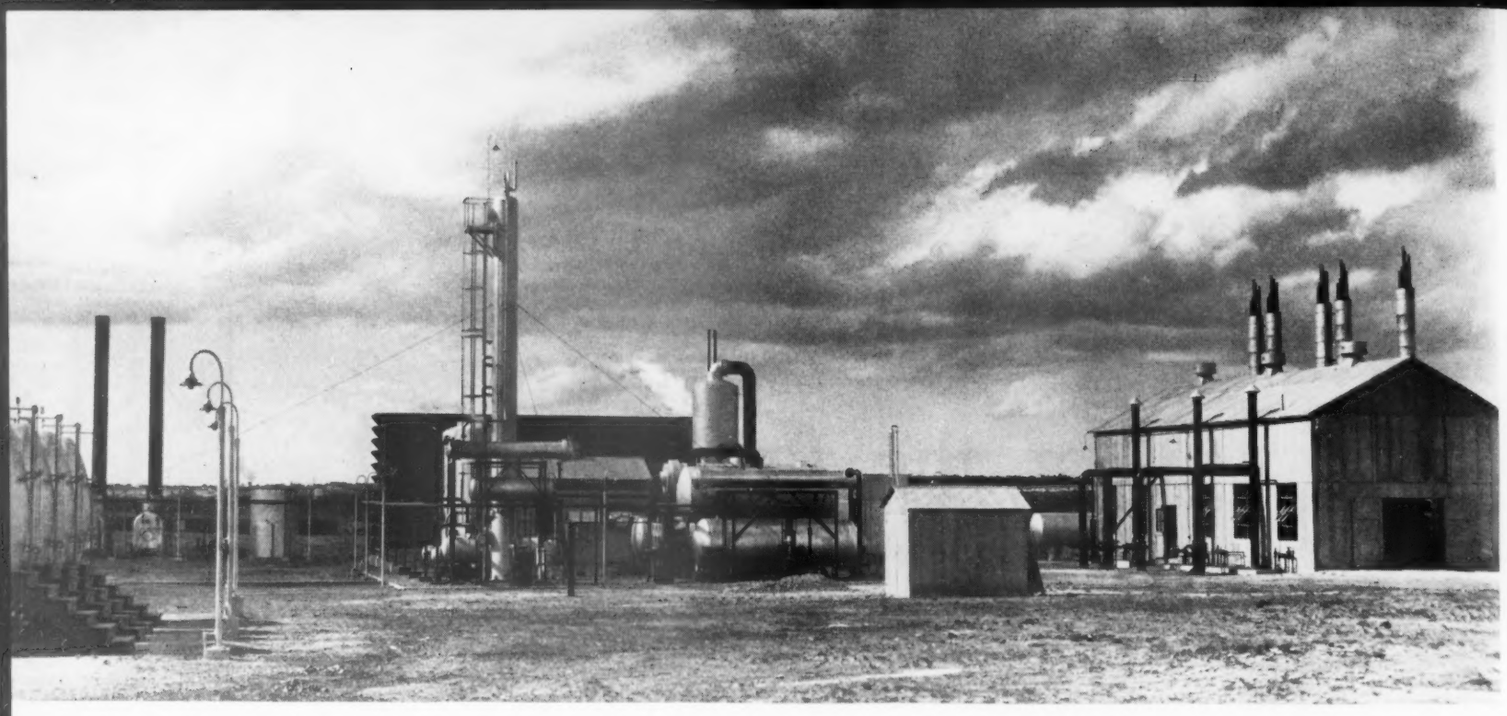

Fig. 1. Propane refrigeration at low pressures is used in this plant of the Duval Gasoline Co. in Benavides, Texas, to recover natural gasoline from 6,000,000 cu. ft. of raw gas per day. Note the extreme simplicity of the equipment required for this process

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New Refrigeration Process Recovers Natural Gasoline at Low Cost

By D. W. Wilson*

ABSTRACT

Natural gasoline recovery process uses propane refrigeration, at 50-60 pounds pressure, simplifying plant operation and equipment required. Concentration of propane-butane constituents becomes a cheap operation with this process.

Very little steam required to operate this unit. Combination of this system with a small polymerization unit appears to be efficient from an economic standpoint. Large plant can be operated by two men per shift. Process can be applied to a wide range of conditions, gas quantities and gasoline concentrations, pressures. Gas may be delivered for any other purpose free of water vapor.

FOR several years the most generally accepted method of manufacturing natural gasoline has involved absorption processes. This has been successful in its application, but has required the use of considerable quantities of absorption oil, with the attendant pumping heating, cooling, and stripping of this oil. This handling of large quantities of oil of necessity means high utility consumption, particularly, usually, of steam. Also, losses of absorption oil and its contamination represent appreciable items of expense.

Considerable interest is therefore attached to the development of a new type of plant for natural gasoline manufacture. This new recovery plant does not use any absorption but employs rather a combination of refrigeration and substantially complete dehydration of the gases. Fundamentally, this process depends upon cooling (after dehydration) the incoming feed gas to a sufficiently low temperature so that all the desirable constituents are liquefied. Subsequently, this natural gasoline is recovered, by the usual stabilization, from this low temperature liquid. Successful application of this involves a knowledge of the physical properties of hydrocarbons at varying low temperatures and varying pressures. The necessary background, both from the theoretical and the practical point of view, has been acquired by the M. M. Kellogg Co. from extensive laboratory research, as well as the actual operation of several thermal polymerization plants. In these plants dehydration of the gas and low temperature condensation are employed exactly as is the case for natural gasoline recovery.

One castinghead plant of this type has been in successful operation for about six months. It is located at the plant of the Duval Gasoline Co., in Benavides, Texas, about 75 miles from Corpus Christi. This installation was designed to handle 6,000,000 cu. ft. per day of wet gas containing about 2.5 gallons per thousand of 26 lb. Reid vapor pressure natural gasoline, and therefore to produce about 15,000 gallons per day of finished product. Actually, as will be discussed later, the incoming gas proved to be richer than this.

Gas enters the Duval plant at atmospheric pressure, is compressed to 50 to 60 lbs. per sq. in. gauge, and is processed at this pressure, the residue gas is consumed as plant fuel or returned to the leases for use there, at about 40 lbs. per sq. in. gauge. Consideration was given to the possibility of producing propane and butane, but this was not

*The M. W. Kellogg Co.

economic and consequently no provisions were made for the recovery of these products.

The field supplying the wet gas comprises several leases and includes about two hundred wells. The separators at the wells operate either at atmospheric pressure or slightly above or below it, depending upon various operating conditions. Some of the wells are equipped with elevated separators, while in others the oil is periodically pumped to storage tanks by the pressure of residue gas operating a small blow-case located at ground level. This operation proceeds automatically by means of a suitable liquid level instrument and is simple and inexpensive. All wells flow continuously through suitable chokes. A network of gathering lines takes the wet gas to the plant and a similar system of lines returns the residue gas to the leases.

Description of Plant

Reference to the flow sheet (Fig. 2) will indicate readily the operation of the plant. Incoming wet gas at substantially atmospheric pressure passes through a scrubber to remove any entrained liquid. This gas is then compressed by gas engine driven compressors to a pressure of 50 to 60 lbs. gauge. This is then water-cooled by an exchanger, then passed through an exchanger where it is further cooled by the cold residue gas to a temperature of 40°F. At this temperature some of the heavy hydrocarbons, as well as considerable liquid water, have condensed. The mixture of liquid and gases is separated in a suitable drum. The water is drawn off and goes to the sewer while the liquid hydrocarbons are pumped to the stabilizer as later described.

The gas from the separating drum is passed through either one of two parallel driers. Here it is freed of water to such an extent that no condensation of liquid water or any solid formation occurs at temperatures as low as —50°F. The water-free gas is then further cooled to a temperature of —35°F. by an exchanger, in which propane evaporates at practically atmospheric pressure. The resulting mixture of liquid hydrocarbons and gases is separated in a drum. From this, the cold vapors serve as a heat exchange medium for the feed gas as outlined above.

The cold liquids are pumped through a heat exchanger cooling the liquid propane, then they are joined by the liquid hydrocarbons produced in the heat exchanger located just before the driers. This liquid mixture then is heat-exchanged against the finished gasoline from the bottom of the stabilizer. The preheated liquid then passses into a 20-tray stabilizer, reboiled at its base by a conventional steam heated reboiler. The stabilizer usually has operated at a pressure of 175 lbs. gauge. The overhead vapors from it are partially condensed in a water-cooled condenser, and the resulting reflux is collected in a drum, from which it is pumped to the top of the stabilizer.

The bottoms from the stabilizer are heat-exchanged with stabilizer feed, as mentioned above, further cooled with water, and then pass to storage as finished stabilized natural gasoline of the desired Reid vapor pressure.

The driers, as stated above, are in parallel and are filled with granular material having high absorptive capacity for water vapor. One drier operates for 24 hours, removing water from the gas passing through it. This unit is then cut out of service and the other is put in use. The accumulated water in the adsorbent must now be removed. This is done, in this plant, by passing through the drier a small portion of the residue gas which has been heated, by a steam heater, to a temperature of 325° to 350°F. This stream of hot gas vaporizes the water in the drier. After a sufficient time the water is completely removed, the steam-heating is then cut off, and the drier cooled by con-

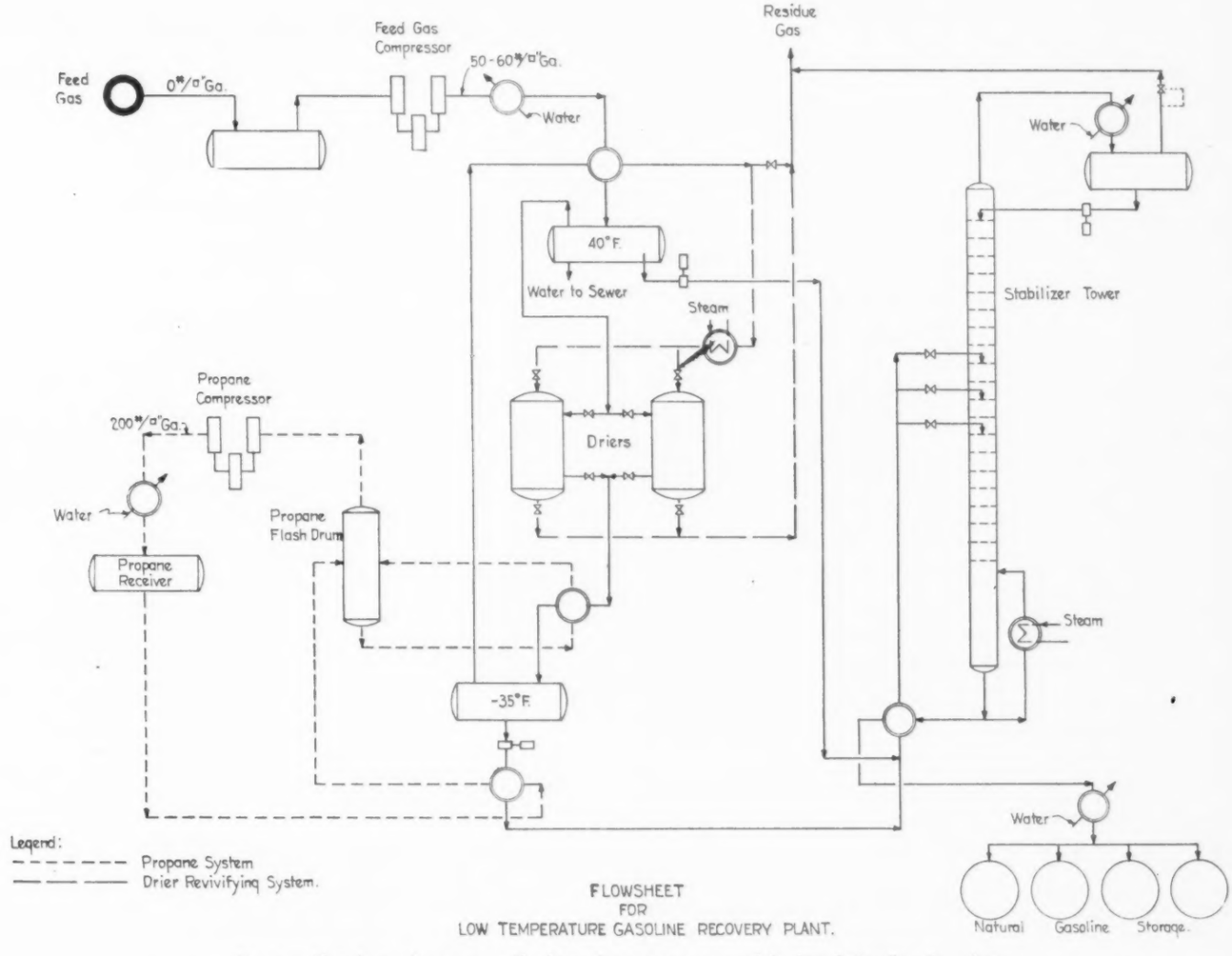

Fig. 2. Flowchart of propane self-refrigeration process, as used in Duval Gasoline Co. plant

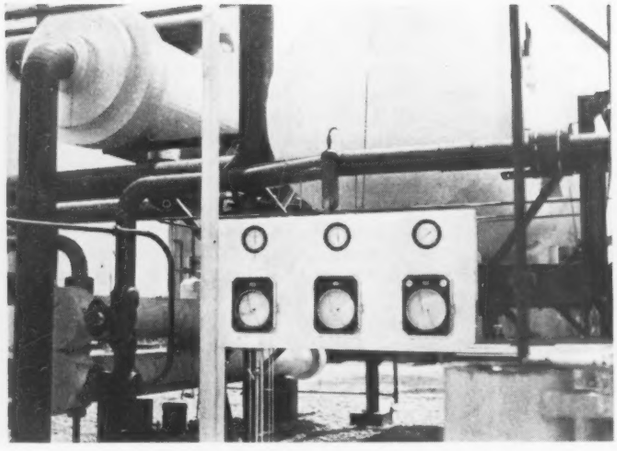

Fig. 3. Instrument panel and exchangers in the Duval plant

tinuing to pass residue gas through it. At the end of six to eight hours the heating, water removal, and cooling are complete, the drier is ready to be put back into service and the cycle repeated.

The refrigeration cycle comprises the following: propane evaporates at practically atmospheric pressure in the heat exchanger as described above in discussing the main plant flow. A drum is provided to prevent any entrained liquid from entering the compressor. Propane vapor from this drum passes to the compressor, from which it is discharged at a pressure of about 200 lbs. per sq. in., it is cooled and condensed by water and passes to a small storage drum. From this drum the liquid propane is cooled by heat exchange with the cold hydrocarbons mentioned above. The propane liquid is then cooled by expansion to atmospheric pressure, and it is then ready for use in the propane evaporator. It will thus be seen that the refrigerating cycle is a closed one and that there is no direct contact between the propane and the gases being cooled.

The plant auxiliary services include a gas-engine-driven electric generator of 175 K.W., a water-cooling tower, motor driven water circulation pumps, and two oil-country type boilers, each of 85 BHP, operating at 200 lbs. pressure. The boilers are equipped with the usual accessories. There are three cooling water pumps, one pumping through closed type coolers and to the top of the cooling towers, one through an open cooling system on the compressors, and the third pumping compressor cooling water from an open pit to the top of the cooling tower. Boiler feed water is obtained from condensate, the necessary make-up being provided by gas lift from existing water wells.

A small boiler feed water tank is included, as is also a 50,000 gallon raw water storage tank. The three water circulation pumps are electrically driven, the boiler feed pumps and the three pumps of the plant proper are steam driven. The plant is well equipped with meters, thermometers, pressure regulators, liquid level controllers and indicators, pressure gauges, and other needed control instruments. For storage of finished gasoline, four tanks, each of approximately 15,000 gallons capacity, were provided.

The above analyses are representative although not averages, and not entirely consistent, especially with respect to the feed gas composition. This varied with the temperature and the pressure at the separators, this variation being particularly noticeable from day to night on account of the widely differing day and night temperatures.

The plant was designed to produce 26 lb. Reid vapor pressure gasoline but current market conditions at the time of taking the above data rendered it advisable to produce the 18.4 lb. gasoline.

It is of interest to note that the analyses indicate 100% recovery of isopentane and heavier with complete absence of propane in the stabilized gasoline.

The plant has continuously processed 6,500,000 cu. ft. per day of gas and produced therefrom 15,000 gallons per day of 18.4 lb. Reid vapor pressure gasoline, as compared to designed figures of 6,000,000 cu. ft. daily and 15,000 gallons per day of 26 lb. Reid vapor pressure gasoline. Capacity was limited to this figure by the feed gas compressors. It will be noted that the installed propane compressor capacity was fifty per cent in excess of that actually used.

Discussion of Plant and Process

Brief study of the included flow sheet and description of process will show that the plant consists of heat exchangers, driers, refrigeration system, stabilizer, and necessary accessories. This has resulted in extreme simplicity of operation and of control. Possibly this is best illustrated by the fact that the plant has been shut down and started up several times in 15 minutes to one half hour.

It is interesting to examine the flexibility and possibility of expansion of this plant. Considerably more than 6,000,000 cu. ft. daily of gas are now available and therefore greater capacity is of real importance. After investigation it has been calculated that solely by addition of feed gas and propane compressors at least one-third additional gas may be processed with the same recovery. Considerably greater further increase in capacity may be obtained by simple and inexpensive paralleling of some exchangers. The inherent simplicity of the equipment lends itself readily and cheaply to provisions for greater gas throughput, since

TABLE 1

Plant Data

Feed Gas Compressor	600 hp.
Propane Compressor Installed	450 hp.
Propane Compressor Used	300 hp.
Boiler H. P. Installed	170 hp.
Boiler H. P. Used	(about) 75 hp.
Water Circulation Installed (except compressor)	1700 G.P.M.
Water Circulation Installed (compressor)	700 G.P.M.

Typical Feed Gas Analysis		Tail Gas	Stabilizer Gas
CH_4	83.46	86.12	26.95
C_2H_6	5.69	7.48	12.57
C_3H_8	4.62	4.38	37.37
C_4H_{10} (Iso)	1.37	.94	14.73
C_4H_{10}	1.57	1.08	8.38
C_5H_{12} (Iso)	1.13	0.00	0.00
C_5H_{12}	.49	0.00	0.00
C_6+	1.67	0.00	0.00

Stabilized Gasoline

C_3H_8	0.00	Grav.	77
C_4H_{10} (Iso)	2.67	90° F.	Initial
C_4H_{10}	19.17	96	5%
C_5H_{12} (Iso)	18.80	100	10
C_5H_{12}	13.27	110	20
C_6+	46.09	120	30
		132	40
		144	50
		160	60
		180	70
		196	80
		220	90
		305	95
		305	E. P.
		95.8	Rec.
		18.4 lbs. Reid Vapor Pressure	

Pressures

Feed Gas	
Plant Inlet	Atmos.
Comp. Discharge	50–60 lbs. gauge
Residue Gas	40–50 lbs. gauge
Propane	
Comp. Suction	Atmos. to 2 lbs. vacuum
Comp. Discharge	Approx. 190 lbs.
Stabilizer	175 lbs.
Steam	200 lbs.

Temperatures

Feed Gas:	
Entering Driers	40° F.
Final Cooler Outlet	–35° F.
Gas for Drier Revivification	325–350° F.
Residue Gas from Plant	75° F.
Stabilizer:	
Feed Entering	160° F.
Bottoms	230° F.
Top	140° F.
Reflux Drum	100° F.

Quantities

Feed Gas	6,000,000—6,500,000 Cu. Ft. per Day
Gasoline Produced	13,000—15,000 Gallons per Day

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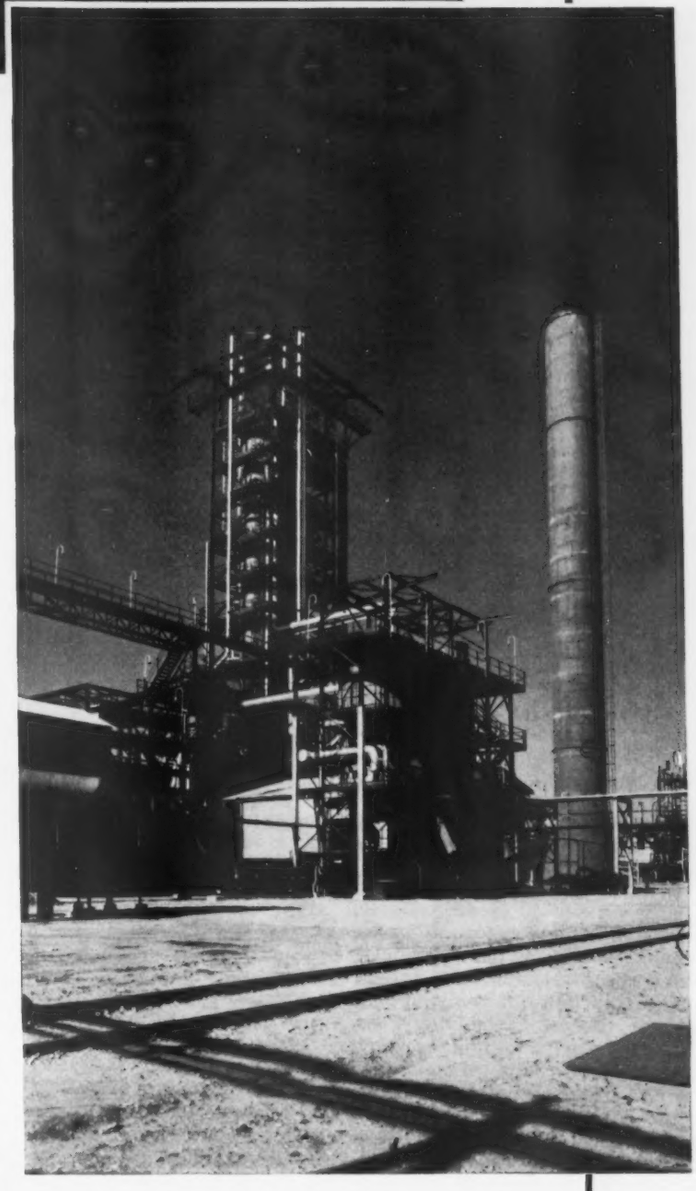

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the stabilizer was purposely designed very conservatively and the driers with no change easily carry a greater load by decreasing the length of time of the drying cycle.

It will be noted that no direct steam is used and that steam consumption is confined to (a) small pumps, (b) heating gas for drier revivification, and (c) stabilizer reboiling. Pumps may readily be driven by gas if desired and the heat for drier revivification may well be supplied by a remotely located direct gas-fired heater or by hot flue gas directly. Thus steam needs may be economically limited to that for reboiling the sabilizer. Where especially important—by modification of the processing—even the stabilizer reboiler heat may be supplied otherwise, thus completely eliminating steam.

A brief further word about the driers may be pertinent. The adsorbent is thoroughly proven since it has been employed for years in oxygen plants where water vapor removal must be much more complete than in natural gasoline recovery since the temperatures in the case of liquid air are much lower. Also, the material has found application for drying in thermal polymerization units. Experience with it in these cases has shown its life, with proper usage, to be practically indefinite with no breakage or deterioration. No troubles with ice or hydrates have been encountered with further cooling of the dried gases.

Due to the extreme simplicity of the entire plant, operating labor is low. There are, on the plant described here, two operators per shift, and it is apparent that a much larger plant or other duties could be handled by these twc men.

In operation of the refrigeration system care must be taken that the propane used is free from traces of water and the piping and valves do not leak, as otherwise ice difficulties or propane losses will occur. Observance of ordinary precautions together with experience gained by operation indicates that ice troubles with the propane need not happen and the cost of propane make-up is very small. It is not possible to give any average figures on this as it depends so completely upon the particular plant operation. Essentially, the refrigeration system does not differ from that used in the common household refrigerators so widely used.

Applicability of Process

Operation at 50-60 lbs. pressure and with feed gas containing two to three gallons per thousand represents only one condition of the many encountered in natural gasoline recovery. An endeavor has been made to study the future field of usefulness of this process. To this end preliminary designs have been made for the following cases:

(a) 200 lbs. pressure and 2.5 gallons per M.
(b) 350 lbs. pressure and 1 gallon per M.
(c) 450 lbs. pressure and 1 gallon per M.
(d) 350 lbs. pressure and ¼ gallon per M.

In some instances capacities have varied for the above from 6,000,000 cu. ft. daily to 100,000,000 cu. ft. daily. Obviously, these selections do not completely cover possible requirements but the range is considerable. In all these cases the process is definitely technically applicable and with substantially complete recovery of isopentane and heavier hydrocarbons. Economics will obviously depend upon prevailing local conditions, especially as to values of gas and gasolines. The temperature to which the feed gas must be cooled varies with pressure and quality from 0°F. to —40°F., a range readily obtainable with propane, or if desired, with ammonia.

Increased pressure is of definite assistance in reducing the drying equipment needed as also in permitting the desired recovery at a higher final temperature of feed gas mixture. Minor changes in heat exchange suggest themselves as feed gas pressure and analysis change. However, from a study of the existing plant in Texas and the four cases enumerated above it appears that this dehydration-refrigeration process, as outlined, has an extended field of application, with high recovery and with the attendant process advantages of flexibility and simplicity of equipment and operation, and relatively low utility requirements.

Combination of Natural Gasoline Recovery and Thermal Polymerization

Study of this casinghead process indicates many advantages in combining a thermal polymerization unit with natural gasoline recovery. One of the major costs of thermal polymerization lies in the provision for obtaining liquid feed of propane and butane and of obtaining recycle feed recovery. By increasing stabilizer pressure and in some cases by other simple modifications in flow, large quantities of liquid propane and butane mixture (containing some lighter material) can be taken—by water cooling only—as a product from the stabilizer reflux drum. This liquid may be pumped through the polymerization furnace, thence to a high pressure tower, from the overhead condenser of which liquid recycle is withdrawn and joined with the liquid fresh feed stream to the polymerization furnace. If desired, the uncondensed overhead vapors from the polymerization unit high pressure tower may be returned through the cooling and recovery cycle of the natural gasoline recovery unit. A low pressure rerun tower and simple clay-treating complete the requirements of the polymerization unit.

It is possible to effect economies in other ways by further combination of these two processes. However, it is not the purpose of this paper to discuss this in complete detail, but rather to point out that simple and relatively inexpensive small thermal polymerization units of this type can be and have been built, and to indicate the important advantages arising from the combination of the two processes. Among these advantages are: (a) low labor costs—two operators per shift are able to handle the small combination unit; (c) low feed recovery costs—this is readily available from the natural gasoline plant by water cooling only; (c) simplicity in equipment and operation; and (d) low utility requirements.

Summary

Briefly, the content of this paper may be summarized as follows:

(a) A new type of plant for natural gasoline recovery has been discussed. This includes freeing the feed gas of its water vapor, cooling the dried gas by propane refrigerant to such a temperature that all the desired constituents are liquefied, and stabilization of this highly volatile liquid.

(b) Operating results of a plant of this kind are given. For six months the Duval Gasoline Company at Benavides, Texas, has operated in this manner, processing from 6,000,000 to 6,500,000 cu. ft. per day at 50 to 60 lbs. pressure and producing therefrom 18.4 lb. Reid vapor pressure gasoline in the amount of about 14,000 gallons per day. Important operating data as to analyses, quantities, pressures, and temperatures are tabulated.

(c) Important features of the process are discussed and include:

(1) Use of simple standard equipment of high salvage value.

(2) Extreme simplicity of operation and control.

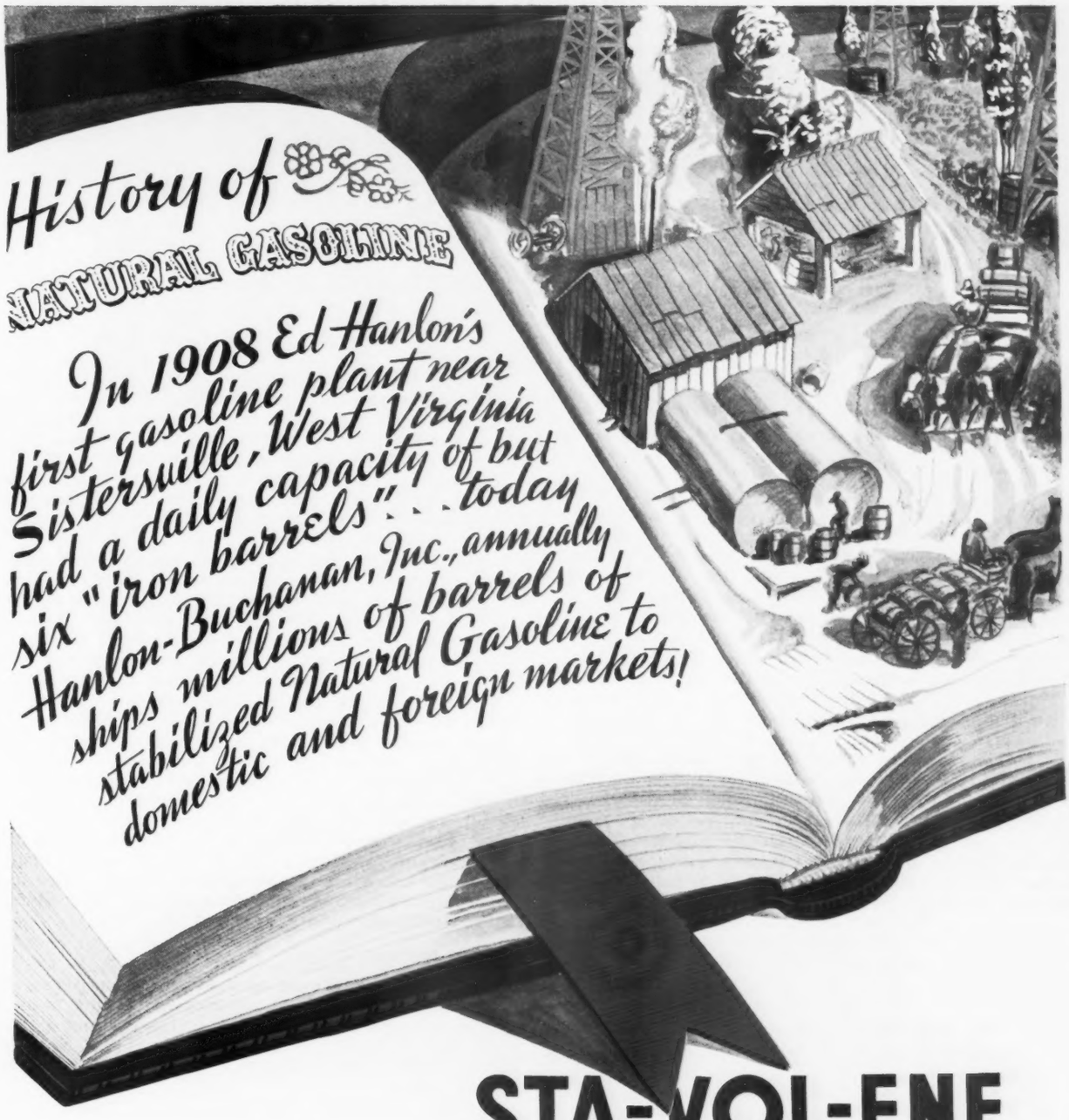
(3) Low utility requirements, particularly steam.

(4) Easy flexibility of plant as to changing feed gas pressure and analysis, starting up and shutting down.

(5) applicability of process is indicated over a wide range of feed gas pressure and feed gas analysis.

(6) Combination of this recovery system with a small thermal polymerization unit is discussed and shown to be highly desirable from the economic standpoint.

(7) It is pointed out that if desired the final residue gas is delivered free from water vapor.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Car Adjustment Large Factor In Anti-Knock Requirements

By R. J. Greenshields,* L. E. Hebl* and T. B. Rendel*

(*Presented under the title, "Anti-Knock Requirements of Automobiles" before the American Petroleum Institute, Wichita, Kans., May 24, 1938.*)

Some new factors in the discussion of anti-knock requirements of automobiles are brought out in the accompanying study based on a summary analysis of the various co-operative tests of the past few years. It is brought out as the authors' general observation that the anti-knock requirement is dependent on the octane number of the available motor fuels supplied due to the flexibility of the spark-advance mechanisms.

The amount of anti-knock testing that has been done at full throttle has been out of proportion to the importance of that operating condition, it is felt by these authors, the high compression ratio required for good part-throttle economy causing knock at full throttle and low speed, so the spark must be retarded depending on the octane number of the fuels available.

Measurements of anti-knock requirements of individual cars are so subject to accidental variations that the entire distribution curve of octane requirements vs. percentage of cars must be considered, it is pointed out, this giving a clearer perception of trends than is possible by watching the single point obtained by averaging the results. Various distribution curves are given and spark-timing curves under different conditions.

INTRODUCTION

EVER since the octane-number scale was adopted as the index of fuel anti-knock quality, attempts have been made to determine what octane value is required to insure freedom from knock. Into this apparently clear pool of research work the industry dived deeply in search of the solution buried under a mass of data at the bottom of the pool. After prolonged search, the muddy waters are now beginning to clear, and the solution has been dredged from the mud at the bottom, and is apparently rather paradoxical; for it seems to be that: "the octane-number requirement of a car is to a very large extent a reflection of the octane-number level of the fuels supplied to that car."

A reconsideration of the problem reveals an interesting sequel to that conclusion, viz., that *the importance of knock at full throttle is decreasing.*[1] Automotive designers necessarily try to improve economy at part throttle, and to obtain this end they must meet certain conflicting design requirements—and, as usually, a compromise must be made. This is done by reducing the power obtained at full throttle slightly by retarding the spark. The amount that the spark is retarded will depend almost entirely on the anti-knock level of the fuels available; there is, therefore, little justification for the petroleum industry attempting to determine the anti-knock requirements of automobiles at full throttle. Thus, attempting to measure the anti-knock requirements of cars is like trying to measure the length of the shadow that is cast by a yardstick; if the octane level of the fuels normally available were to drop suddenly to 65, the cars would adjust themselves in a comparatively short space of time to that anti-knock requirement.

Now before driving again in search of further data in the belief that a full-throttle anti-knock level exists as a car characteristic, and may have changed with changing models—thus further muddying the waters—let us consider this paradoxical conclusion and assume for a while that, after all, it is probably correct and possibly the only one which we could have obtained from such a dive. The conclusion applies to the problems concerning all of the cars in this country as a group, rather than to any individual car. Even in an individual car, the minimum octane number that is required to prevent knock varies under certain conditions. Accidental variations are frequently greater than the effects of a single operating factor, so that the effects being studied are often masked by these chance variations. In fact, the study of anti-knock requirements is apt to be hindered by the appearance of relationships in limited data leading to conclusions which are subsequently refuted by other data. These difficulties are encountered even when the results of many measurements are averaged together.

Previous Surveys

Despite the difficulties encountered in measuring the anti-knock requirements of automobiles, results have accumulated on more than 500 cars during the past 6 years, from the results of which certain trends can be found. These data have been reported in various cooperative surveys as follows:

1932 CFR† Tests at Uniontown, Pa.
1934 CFR Tests at Uniontown, Pa.
1936 Automotive Survey Committee Data.
1937 Automotive Survey Committee Data.
1937 CFR Cooperative Road-Test Work.

At the time when these various cooperative surveys were made, there was no opportunity to compare all of the data; and the present study is an attempt to do this. No attempt is made to introduce new data, but rather to offer a comprehensive analysis of results that have already been studied once and probably forgotten; therefore, the individual results are not re-tabulated. Using these data as examples, it is hoped to present a fresh outlook by which certain worthwhile conclusions begin to take definite form.

Analysis of Survey Data

If, instead of considering individual measurements of octane numbers of blends of standard reference fuels required to eliminate all knock, or even the average of many measurements, the entire range of the data is inspected, we arrive at a series of curves of the percentage of cars

*Shell Petroleum Corp., Wood River, Ill.
[1]Italics are ours—Ed.
†Cooperative Fuel Research Committee.

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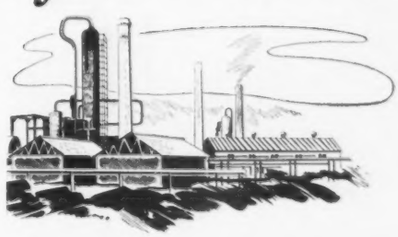

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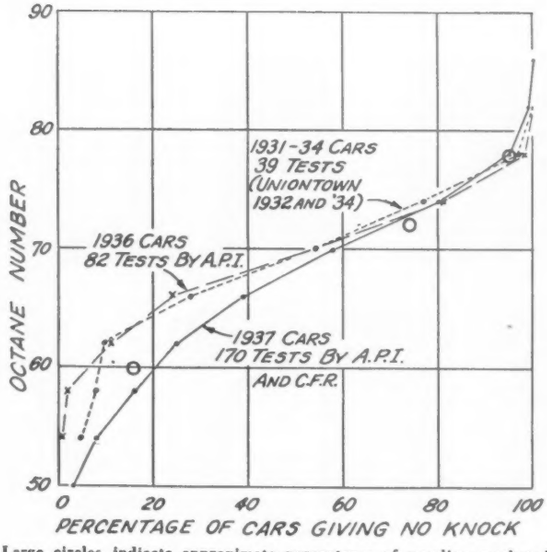


Large circles indicate approximate percentages of gasoline marketed below given octane number.

Fig. 1. Curves showing the percentages of cars on the road which give no knock on fuels of different octane numbers

which will give no knock plotted against the octane number somewhat as shown in Fig. 1. In these curves the octane-number requirements as measured on the road are divided into groups separated by increments of 4 octane numbers along the ordinate scale. The number of results in each of these groups is plotted on the abscissa as the percentage of the total number of results available. Each of the distribution curves so obtained is labelled to show the number of tests from which it was plotted.

An inspection of these curves shows that only about 10 per cent of the cars tested required 78 octane number, and roughly 60 per cent of the cars tested gave no knock on a 70-octane gasoline. Approximately one-third gave no knock on a gasoline with an octane number of 65. The results on 1937-model cars appear to scatter over a wider range of octane numbers than those on previous model cars. It is possible that this wider scattering was caused by the fact that several of the laboratories that cooperated in this survey had not done so in the previous ones and, consequently, may have introduced variations because of inexperience with the testing procedure. However, the three curves agree very closely in the range above 70 octane number; so it seems safe to conclude that, from 1932 to 1937, anti-knock

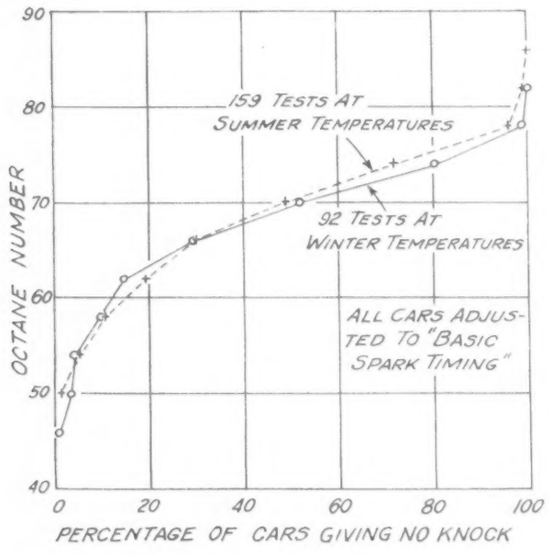


Fig. 2. Comparative tests at winter and at summer temperatures show the following curves which give the percentage of cars showing no knock at different octane numbers

requirement has not changed appreciably. Each of the distribution curves has a longer "tail" extending downward from the 50-per-cent point than the one extending upward, caused by the non-linear nature of the octane scale.

When studying these curves, there is one very important point to be remembered. Inasmuch as the measurements were made with reference fuels, the ordinate scale represents *road* octane numbers; and the discrepancy between road and laboratory octane numbers of commercial gasolines and reference-fuel blends tends to muddy the waters still further. Therefore, when using these curves as a basis for studying a particular fuel whose laboratory octane number does not agree with its road rating, the latter must be used; as the octane-number scale is rigidly related to the anti-knock value only in the laboratory engine. When used to interpret the performance of fuels in different engines, it becomes elastic like a rubber yardstick—and not much more reliable.

Atmospheric Temperature and Spark Timing

The influence of atmospheric temperature is a complex one. It is known that imperfect distribution at low temperatures may cause some cylinders to knock due to leanness; while, on the other hand, high temperature itself tends to cause all cylinders to knock. The factors involved appear to produce a negligible resultant effect, as shown in Fig. 2. This figure does not include all of the data included in Fig. 1; so the curves happen to be about 1 octane

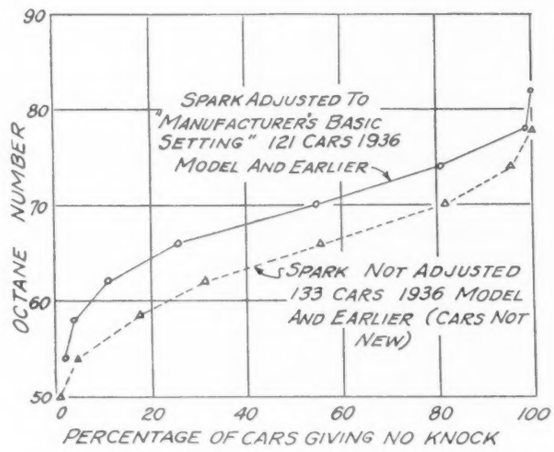


Fig. 3. Curves showing the differences in knock tendencies of cars which have been variously adjusted and the knock obtained when the cars are adjusted for "manufacturers' basic spark settings"

number lower—although from the data available it appears that the knocking tendency is not sensitive to temperature. Of course, the anti-knock requirements of some individual cars increase while others decrease with temperature, although this does not affect the distribution curve of the whole.

It is interesting to speculate what result is produced when the spark timings of cars are adjusted to the so-called "basic factory setting" or "manufacturer's standard timing." Some work has been done on older cars whose octane requirements were determined without spark adjustment, as shown in Fig. 3, in comparison with the requirements obtained on new cars with the spark adjusted. In general, the octane requirements of the older cars were about 4 units lower than those of the new cars. It is possible that during the life of some of the older cars, a low-octane fuel occasionally was obtained, causing detonation. To eliminate this knock, the spark was retarded—where it remained. If this occurred more often than those cases where the spark was advanced to take full advantage of the anti-knock value of the fuel, the lower distribution curve on the older cars would be expected. However, regardless how they got that way, the fact remains that the cars as found after a

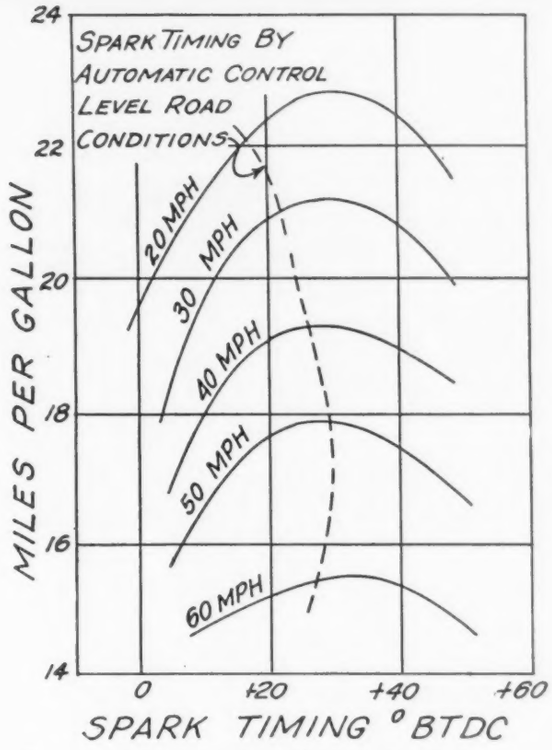


Fig. 4. The effect of spark timing on fuel economy at normal loads

year or so of use had lower octane requirements by about 4 units.

Summary of Previous Surveys

We now see that by watching the entire anti-knock-requirement distribution curve, rather than by watching the single point obtained by averaging the results, there are definite and reproducible movements in the data that can be recognized from the buckets of data which formerly appeared to be almost lifeless. It seems clear from the study that the anti-knock requirements of cars closely match the anti-knock levels of the gasolines generally available, and that little change is experienced throughout the year or from year to year as car designs change or cars get out of normal adjustment. The existence of this similarity, however, does not necessarily prove that there is any definite relationship between the two, unless it can be shown that there is a reason for this coincidence. A swim in the clear water can now be made, and a reconsideration of the problem soon reveals a more complete solution.

Reconsideration of the Problem

There would probably be no anti-knock-requirement problem were it not for the fact that cars and fuels are produced by separate industries. Suppose the manufacturers of cars also supplied the fuels. They would logically consider one of their primary problems that of striking a balance between the cost of increasing the anti-knock value of the fuel and the car performance and consumption of fuel at various compression ratios, such that the cost of transportation would be a minimum. The mere fact that the manufacture of cars and fuels is split between separately-managed industries is no reason why a reasonable balance should not be maintained, based upon the economic and engineering factors involved. Actually, at present, there is no other coordinating force except established practice and fuel price, which tends to limit the anti-knock requirement. It may be that some other level, either higher or lower than the present 70 octane number, would give greater economy when car performance, fuel consumption, and fuel cost are considered.

The Need for High Compression Ratios

The two outstanding performance factors of automobiles which are affected by the compression ratio are power and economy. The former is only partly determined by compression ratio; among the other factors which also affect the power are piston displacement and volumetric efficiency (including supercharging). Thus, if an increase in power is needed, it does not follow that the anti-knock requirement must be increased. Increased power can even be obtained with reduced octane requirement by using a larger or higher-speed engine of either lower compression ratio or with retarded spark.

To improve the efficiency it is not so easy to avoid increasing the compression ratio. After controls have been developed to maintain the mixture strength and spark timing at the values giving the best efficiency obtainable, further improvement in thermal efficiency is practically limited by compression ratio alone; neither engine size nor supercharging materially improves the efficiency. Fuel consumption is particularly important at part throttle, because that is the condition under which most gasoline is actually consumed. Therefore, the first consideration in choosing the compression ratio of an engine should be part-throttle economy. The part-throttle spark timing can be so controlled at various speeds as to give approximately maximum economy. This is demonstrated by the curves obtained at part throttle and shown in Fig. 4 for a typical 1937-model car. Because of the reduced pressures, this spark timing does not cause the engine to knock.

Prevention of Knock at Full Throttle

When the throttle is opened to increase the power output, the tendency to knock increases greatly; therefore, it is necessary to retard the spark even to the point where power is lost for full-throttle operation. This differs somewhat from aviation practice—where there is no automatic spark control, and knock is prevented at full-throttle take-off by enriching the mixture or by changing to a fuel having greater resistance to knock. The amount by which the spark is retarded at full throttle in the same 1937 car is shown in Fig. 5.

Although the reason for opening the throttle is to increase the power output, it is obvious from Fig. 5 that the spark timing at full throttle does not give the maximum power that could be obtained if greater advance were used. Fig. 5 also shows the maximum spark advance with a commercial-grade 70-octane gasoline that could be used without detonation; and the automatic spark control must not advance the spark above the values shown by this curve.

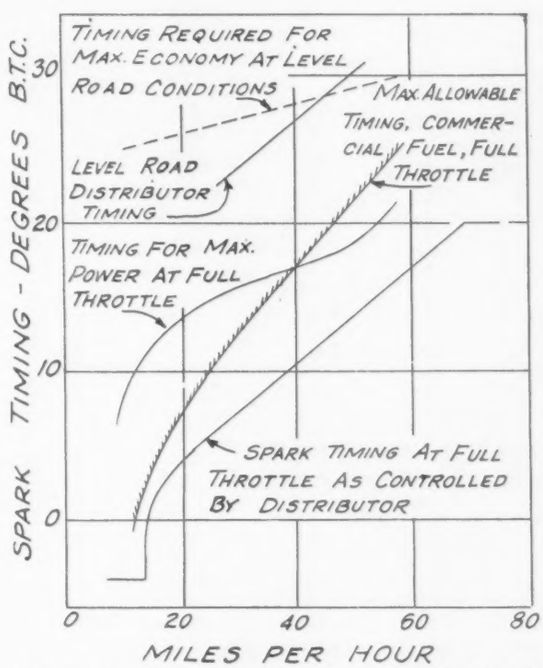
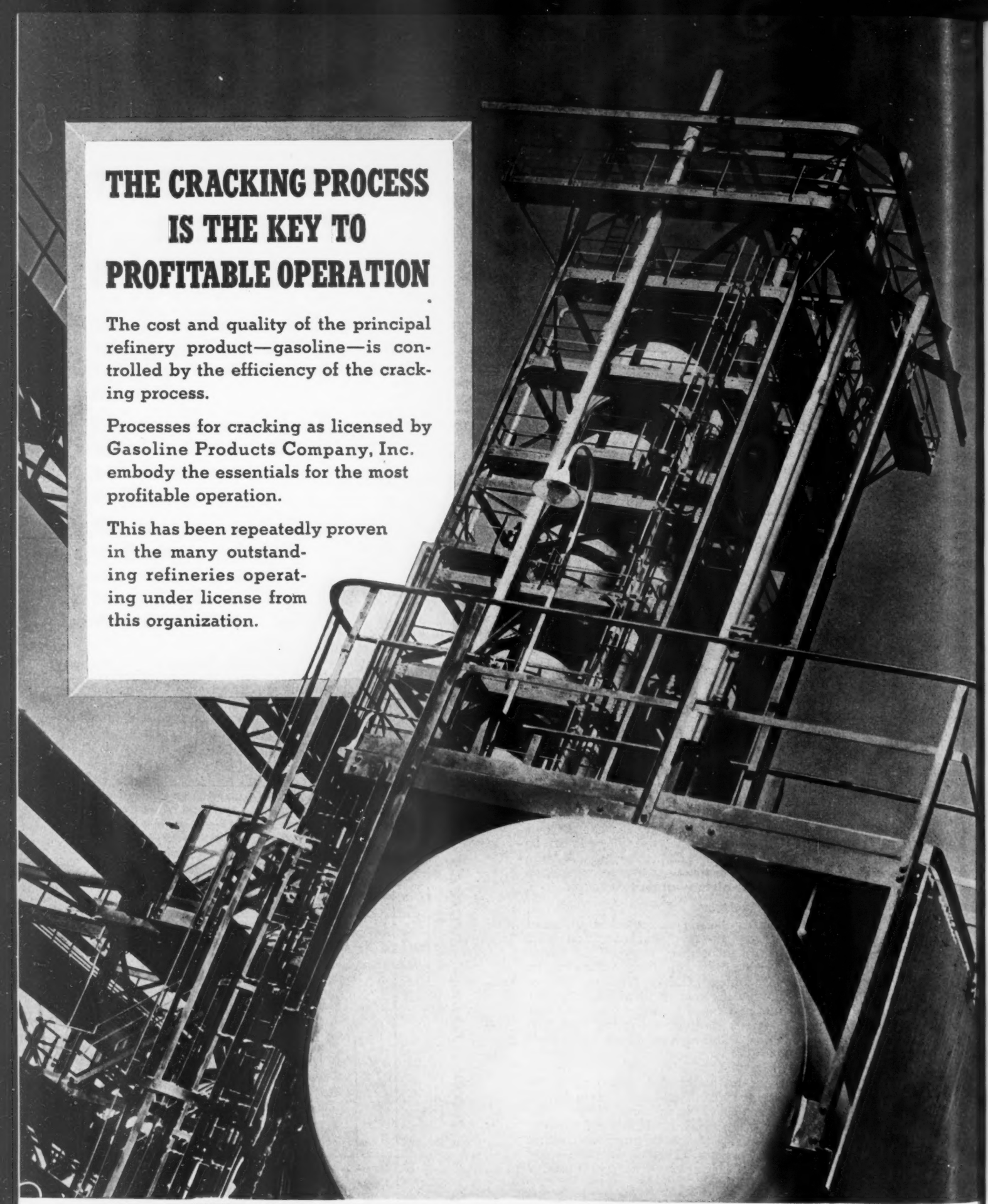


Fig. 5. A comparison of spark-timing requirements of a 6-cylinder, 1937, L-head engine with 6.5 compression ratio, at part and full-throttle operation. This illustrates the problem of getting the best from an engine at all speeds and loads with, for example, an automatic timing control



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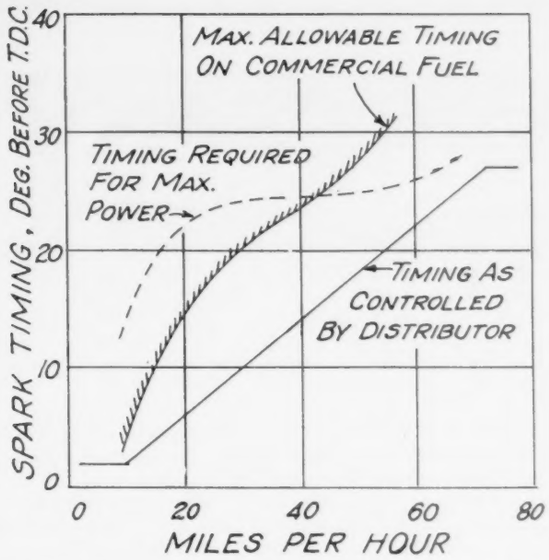

Fig. 6. These curves show that automatic timing cannot give maximum power at full-throttle at all speeds

Fig. 6 and 7 show similar curves for other cars, and indicate that the automatic advance mechanism cannot be set to give maximum power at full throttle at all speeds. Table 1 shows, in terms of octane number, the reduction in anti-knock requirement which can be obtained by retarding the spark to prevent full-throttle knock.

TABLE 1

Influence of Spark Timing on Power and Anti-knock Requirements of a Typical 1937 Car

Retardation from Setting for Maximum Power at 20 M.P.H. (Degrees)	Percentage of Maximum Power (Per Cent)	Power Loss for One Additional Degree Retard (Per Cent)	Octane Requirement (No.)
0	100	0	83
6	98	0.5	77
12*	93.5	1.1	70
14	91.5	1.3	64
17	87	2.0	56

*Present setting on typical modern car.

In the case of the car from which the above data were taken, retarding the spark by 5 deg. more than the present setting at full throttle decreased the anti-knock requirement by 14 octane numbers; while retarding the spark 2 deg.

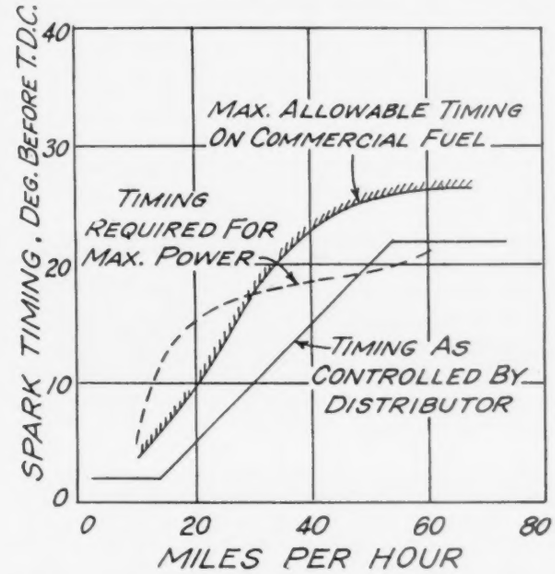

Fig. 7. Full-throttle spark-timing curves for a 1938 L-head 6-cylinder engine. Engine compression ratio, 6.0

caused a reduction of 6 octane numbers in the anti-knock requirement. This is confirmed by a study of various data obtained in 1937 which show that, on the average, the anti-knock requirement increases about 2 octane numbers for each degree of spark advance.

Loss of Power at Full Throttle

Now if it were desired to increase the power by advancing the spark to that required for maximum power, it would be simplest to reduce the compression ratio to prevent knock. However, the compression ratio cannot be reduced, because that would impair part-throttle economy; and, without a radical re-design of the engine in some way not yet worked out, it is difficult to see how to obtain the full power of the engine using the same fuel that is just suitable at part throttle.

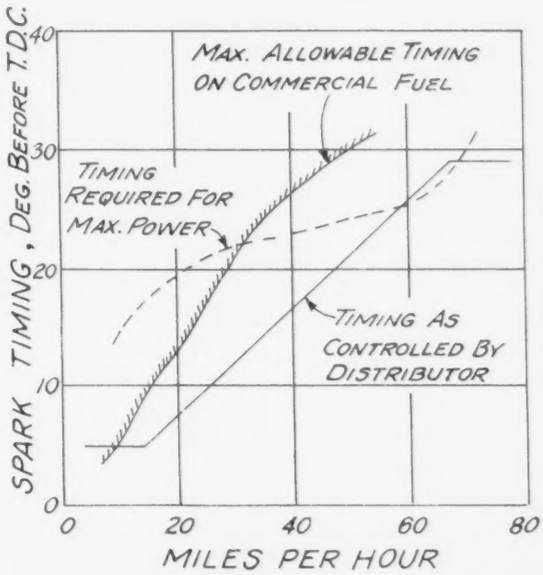

Fig. 8. Full-throtte spark-timing curves on a 1938 L-head 8-cylinder engine, at a compression ratio of 6.2. These curves are similar to those in Fig. 5

However, the effect of spark advance on power output varies for different spark settings. Thus the first two or three degrees on either side of the setting for maximum power have no measurable effect—although, as the spark is retarded further, the power decreases at an accelerating rate.

The loss in power is also shown in Table 1, and was about 7 per cent for a 5-deg. retard at 20 m.p.h.—the loss being less at higher speeds. Fig. 6 and 7 show the full-throttle spark-timing curves on a 1936- and a 1938-model car, in both of which maximum-power spark timing is obtained at high speed. Thus, when the distributor is advanced in either of these cars, the power increases at low speed, but actually decreases at high speed where the spark is already over-advanced. Fig. 8 shows the curves obtained on a 1938-model car which were similar to those on the 1937-model car shown in Fig. 5.

In general, the loss in power suffered at high speed when the spark is retarded is either very small or zero; while the loss at low speed is of the order of 1 per cent for each degree the spark is retarded.

Inasmuch as the power falls off at an increasing rate when the spark is retarded, there is a limit to the amount that the octane requirement can be reduced by retarding the spark. Also the octane number of the fuel could not be reduced beyond the point where knock occurs at part throttle; but there is no logical reason why the full-throttle octane requirement should be above that at part throttle. It is quite obvious that more attention should be placed on part-throttle performance. Information is needed regarding the anti-knock requirement at normal load and the effects of engine settings on part-throttle performance.

In general, it is felt that the amount of anti-knock

(*Continued on page R-474*)

"Reactive" Or "Protective" Colloids, OR BOTH?

(Discussion of the article by L. D. Betz on treatment of water with colloids.)

FOLLOWING the publication in the Refining Technology Edition of NATIONAL PETROLEUM NEWS of the article "Some Properties of Colloids, and Their Use in Water Treatment", (Dec. 15, 1937, p. R-386) by L. D. Betz, considerable interest was aroused among refiners on the data given therein on conditioning boiler waters for refining purposes.

On any subject in which the chemistry is yet not fully understood, differences of opinions exist as to the correct explanation of terms and of "reactions" which take place. We are therefore publishing here two letters, discussing this article and the chemical phenomena which appear to be important to the subject. The first letter was written by L. M. Potts, chemist of Feedwaters, Inc., New York City, as a discussion to clarify some of the points and expressions given in Betz' paper, or to take issue with statements or claims with which Potts disagrees.

The second letter was written by L. D. Betz, as a reply to the Potts discussion, to further clarify Betz' position. We believe the information assembled in these two letters, studied in connection with the article mentioned will do much to clear up in the mind of the chemist some of the important but frequently confusing matters involved in this subject. The letters are here presented as useful information in the literature of feed water conditioning. A second article, by L. D. Betz appeared in NATIONAL PETROLEUM NEWS' Refining Technology Edition, April 6, 1938, page R-167.

* * *

There has just come to my attention the article "Some Properties of Colloids, and Their Use in Water Treatment" by L. Drew Betz in the Dec. 15, 1937 issue of NATIONAL PETROLEUM NEWS.

The expression by Mr. Betz of his intention to assist in the complete routing of those quacks in the water conditioning field who are attempting to invade the field of water conditioning by means of colloidal chemistry, is indeed a laudable one, and any effort to clear up misconceptions in regard to colloidal methods of conditioning boiler feedwater is indeed worthy. With that in mind, the liberty is being taken to endeavor to clear up some misconceptions with regard to colloids which, it is felt, may arise from the reading of Mr. Betz' article.

It is with pleasure that it is noted that the author of the article in question writes: "It is not to be implied that a straight chemical reaction can be written showing a given molecular weight of colloid reacting with a given molecular weight of calcium or magnesium, or in other words that the reaction proceeds in stoichiometric fashion." Previously, it was considered by some few, the author of the article in question included, that such a stoichiometrical relationship existed, as is evidenced by his saying: "The reaction taking place in the formation of the gel from the colloid which, incidentally, is the true basis of functioning, may be expressed in the following: $Na_2X + CaSO_4 = CaX + Na_2SO_4$. In the above reaction we have allowed X to stand for the acid radical in the colloid." In the paper he delivered in June, 1929, before the National Board of Boiler and Pressure Vessel Inspectors at the Hotel Fort Shelby, Detroit, Mich., on the subject of "Boiler Water Correction Through the Application of Colloidal Gels."

For many years I, and the organization of which I am a part, have tried to prevent this misunderstanding from gaining ground among the less informed on colloidal materials. In the article in the December 15, 1937 issue of NATIONAL PETROLEUM NEWS it would seem that effort is made to set up a differential between protective colloids and so-called "reactive colloids". The error of this has previously been pointed out by Feedwaters, Inc., and is once again here pointed out.

In the article in question there appears "A protective type of colloid, is one that does not enter into the reaction, but rather is supposed to form a protective sheath about a crystalline precipitate as it is formed." A knowledge of the mechanism of protective action will tend to break down this inadvised distinction.

Professor Arthur W. Thomas, of Columbia University, in "Colloid Chemistry" published by the McGraw-Hill Book Co. writes: "When a solution of a hydrophilic colloid is added to a less stable colloidal dispersion, or suspension, generally there is no change in appearance of the system and the less stable dispersion is found to have become more stable; i.e., it is no longer so sensitive toward either the addition of electrolytes or evaporation to dryness. The less stable dispersion is said to have been protected by the hydrophilic colloid; hence the term protective colloid which is commonly applied to the hydrophilic colloids, such as gelatin, gum arabic, soap. It would be well to stop for a moment in order to show that protective colloids do not differ so radically from others in their behavior in mutual reactions. *It is more a difference in degree than in kind.*" The italics in the preceding sentence are those of the writer.

Work by Beans and Beaver, and others, has definitely shown that protective reaction results from sorption by the colloid of particles of the material protected—quite the same type of "reaction" that is attributed by the author of the paper in the December 15, 1937 issue of NATIONAL PETROLEUM NEWS, to "reactive colloids".

Jerome Alexander in Volume I, page 923 of "Colloid Chemistry" published by The Chemical Catalog Co. Inc., in speaking of protective colloids and protective action writes: "These effects are all attributable to the formation in the solution of adsorption complexes, or complexions, between the protective colloid and one or other of the ions of the compound being precipitated. This renders precipitation of the compound either impossible or at least difficult."

Many other quotations from authorities on colloidal chemistry can be made to show that it is not a case, as stated by Mr. Betz, of colloids being divided into two classes —protective and reactive colloids: the protective colloid being very limited in scope; but rather that protective colloids possess all the properties of other colloids *and in addition* the ability to exercise a protective action. Nowhere in the literature, as voluminous as it is, has the writer been able to find a single authoritative reference to a definite

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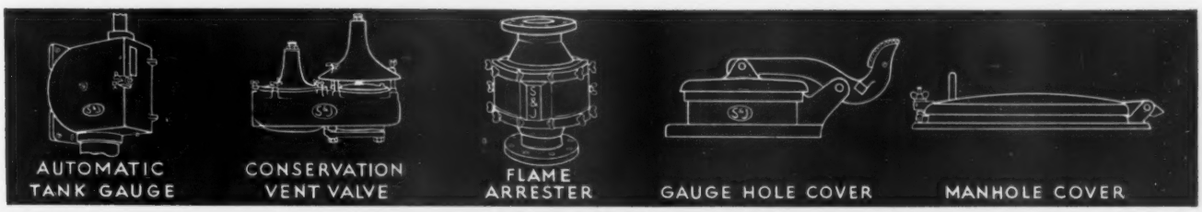

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class of colloids known as "reactive colloids" in contradistinction to any other type of colloid, and it is felt that this effort to make such a distinction is highly misleading and tends to obviate the avowed effort of Mr. Betz to rout from the field of water conditioning the quacks who are trying to gain entree. Rather does it seem that it is aiding and abetting them by tending to becloud and disguise the scientific facts in connection with colloids and their application to water treatment.

L. M. Potts, Chemist
FEEDWATERS, Inc.

* * *

Reply by L. D. BETZ

In reading Mr. Potts' discussion of my paper, one gains the impression that according to him it becomes impossible to obtain reactions with colloidal sols or gels, and that what changes do occur are all due to a two-fold action of adsorption and protection. He further strengthens this impression by referring to certain publications and references offering quotations from such works that the phenomenon involved is that of adsorption rather than a reaction.

If Mr. Potts is laboring under this impression, I fear he is in error. There is a complete chapter in Alexander's "Colloid Chemistry", Vol. 1, written by Prof. Holmes of Oberlin College, entitled "Reactions in Gels", and another in Bancroft's book "Applied Colloid Chemistry" entitled "Chemical Reactions".

The question of whether a reaction is of a purely chemical nature or of whether it is purely physical is, however, a controversial issue, and one that does not enter into this discussion.

The term "reactive colloids" used in my article, to which Mr. Potts refers, as stated in the article itself, was used to differentiate those types of colloids which were precipitated by an electrolyte, from those possessing no such effect, such as tannins and starches. As to the degree of the reaction, Mr. Potts is referred to the article itself in which I distinctly state, "When calcium or magnesium ions, or any other polyvalent positive ions are added to a system, with this sol present, a selective *adsorption* of the calcium and magnesium ions occur, with the removal of these ions from solution". Such a reaction does not occur with starches and tannins. The fact that I used the term "reactive colloid" to describe this differentiation seems, to Mr. Potts, to be a gross miscarriage of justice, because he could not find the term quoted in a recognized book of authority. I doubt if he can find the term "reactive chemical" in any text book of inorganic chemistry, yet it is common knowledge that chemicals do react with certain other chemicals. That there is need for a further classification, such as I have used, is borne out by Bancroft (1) when he states; "since a colloid peptized by water may be charged positively or negatively, there is no reason why it should not precipitate another colloid under suitable conditions. We usually consider the colloids peptized by water solely as protecting colloids, but this is clearly an inadequate view, as is shown by experimental data".

We have in our research files, experimental data to prove that the types of colloids, to which I refer in my article, unite with calcium and that the quantities of calcium ions that will unite, will vary under different concentrations, temperatures and pressures.

There is a wealth of data in the literature of colloid chemistry proving reactions between electrolytes and colloidal sols and gels. Graham (2) as far back as 1862, in the very early days of colloidal chemistry, pointed out that colloidal silica was precipitated by gelatine, and that the composition of the precipitate varied from 56 to 92 parts of gelatine per 100 parts of silicic acid.

H. Freundlich (3) has shown that ions of electrolytes, carrying charges opposite to those carried by the colloid, will discharge and therefore coagulate the colloid. True, specific adsorption of active ions at the surface of the colloid and their valence, play a decisive part. Those ions which are most strongly adsorbed and which carry the higher charges, are most potent as coagulants.

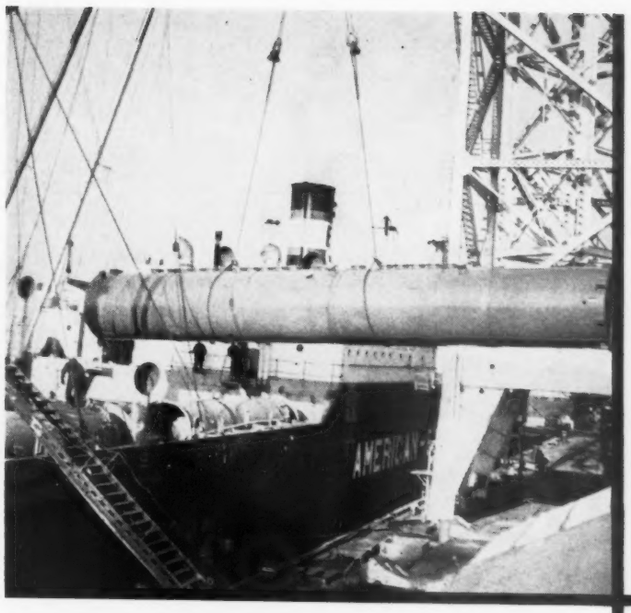
Prof. Fodor, (4) has this to say about the matter; "Silicic acid or stannic acid gel is dispersed or peptized - - - - by very small amounts of alkali. Here, we see evidence of the chemical affinity between an acid and a base. But, there exists a difference, which, if not qualitative, certainly is quantitative, between the cases where molecularly dissolved acids and bases *react* and where a molecularly dissolved base is combined with a colloidally dispersed acid. The first instance is controlled by Dalton's law and by stoichiometry, which is based on it. But the well known laws of constant and multiple proportions fail when chemical valences, instead of being those of true chemical molecules, of a dimension of about 10^{-8} cm. act on colloidal particles, which aside from their active surfaces, have a variable inactive mass." This is exactly the reaction referred to in my paper, namely—the combination between a colloidally dispersed acid and a molecularly dissolved base.

Prof. Lottermoser (5), speaks of "the well known law" that negatively charged colloids are the more readily precipitated by electrolytes, the greater the valency of their cations; that therefore their precipitation threshold value decreases rapidly with increases in valency of the cation; and that, conversely, positively charged sols are especially sensitive to the action of electrolytes with polyvalent anions.

Mr. Potts, in quoting the work of Beans and Beaver, (6) states that they have definitely shown that protective action results from sorption by the colloid particles of the material protected. There is no argument in my article to disagree with this statement, but I do vigorously differ with him when he says this is the same type of reaction to which I refer in my paper, and that all colloidal actions are similar. If Mr. Potts will read page 466 of "Colloidal Chemistry" by Thomas, to which he refers in his discussion, he will find the following: "Beans and Beaver have performed an experiment which shows that the protection of *colloidal gold* by gelatine is due to sorption of the gelatine by the gold particles." (Italics mine). This is something entirely foreign to the subject of my paper, and has no relation whatsoever to the statement I made that the types of colloids to which I referred, effected a precipitation of the calcium and magnesium ions. Beans and Beaver are describing the protective action of gelatine with colloidal gold, while I describe the precipitating action of polyvalent positive ions with a negatively charged sol. In view of the fact that Mr. Potts has missed the meaning by such a wide margin, it might be well to look into the other references given in his discussion.

In the reference quoted by Mr. Potts on page 923, of "Colloidal Chemistry," Vol. 1, by Jerome Alexander, if one refers only to that part of the quotation contained in his letter, it becomes quite confusing. By reading only that part of the quotation given by Mr. Potts, one would procure the idea that the author states the presence of protective colloids in a solution results in the formation of adsorption complexes making precipitation either impossible or at least difficult. What Mr. Potts failed to say was that this quotation appears in a chapter entitled "The Colloidal Aspect of Analytical Chemistry" and that the author is commenting on the difficulties that the presence of some colloids can cause in producing errors in methods of analysis, again entirely foreign to the subject of my paper. Had he included the sentence immediately following the quotation he gave, it would have shed an entirely different light on the subject. The sentence which he left out reads as follows: "It is well known that the presence of colloidal organic matter in solution is liable to give trouble in many inorganic estimations and it should always be destroyed if possible." Sometimes, a quotation given only in part, destroys the entire meaning of the author.

In reply to the comments of Mr. Potts on the paper which I delivered before The National Board of Boiler and Pressure Vessel Inspectors, in which I have set up a type reaction, I certainly cannot figure out on what basis he was ever under the impression that I said colloidal reac-



Shipments

BY WATER

Our plant is not only one which is equipped with every modern facility for the production of massive, all welded pieces of refinery equipment, but it is located at the mouth of the Philadelphia Harbor with piers, large cranes and every facility for water shipments direct from our plant.

SUN

SHIPBUILDING & DRYDOCK COMPANY

CHESTER, PENNSYLVANIA

tions proceed on a stoichiometrical basis. Nowhere in the paper referred to, nor in any other paper we have ever published, does this statment appear. In fact, numerous papers have appeared in which we have distinctly made the statement to the contrary. In this same paper, to which Mr. Potts refers, appears this statement, "In short, the calcium salts or the magnesium salts, as the case may be, have been the cause of the *agglomeration* of the colloidal particles to form the gel." At the time this paper was written, I was fully aware of the views of the others on this subject, particularly that of Alexander contained in the following quotation, (7) "In reading over the numerous practical applications of colloid chemistry—it must be remembered that most of the *reactions* lack that preciseness indicated by the present meaning of the term 'chemical compound.' Slight deviations from previous conditions may involve a material difference in results, and until we understand, and can give proper weight to all the underlying factors, many of our successful methods will remain 'cooking recipes.' Colloid chemical research is letting in a flood of light upon many *reactions* not amendable to the ordinary stoichiometric laws of chemistry, though in some cases they may closely approach these laws."

As a matter of fact, the paper to which Mr. Potts refers, was delivered before a group of men who were not chemists, but a society comprised of chief boiler inspectors. It was therefore necessary to express all statements in as clear and understanding manner as possible and to refrain from a detailed and highly technical discussion. Furthermore, a representative, who was the chief chemist at the time, of the company with whom Mr. Potts is at present associated, was at this very meeting, and no point of issue was raised nor questions asked as to the expression of the type reaction used. This all occurred just nine years ago and it does seem peculiar that this statement, if incorrect, should remain unchallenged for so long a period of time.

Furthermore, this chief chemist, from Mr. Potts' company that was present at that time, also presented a paper to the same society on the subject of colloids and in concluding his remarks, made this statement, "In concluding, it might be well to state that one colloid of organic origin, has been found to possess all the ideal requirements for the colloidal conditioning of boiler water. This colloid requires the presence of soda in order to effect its peptization and put it in colloidal solution. This established the first condition necessary and introduces another desirable view. Because of this *CHEMICAL REACTION* can be utilized for the conditioning of water wherever it is deemed advisable." (Caps and italics mine.) Here we have a statement from the chief chemist of Mr. Potts' company who claims colloids produce not only reactions but CHEMICAL reactions as well. It certainly seems peculiar that such a reversal of attitude should be existing in any one company.

Mr. Potts gives us the impression that all colloidal reactions are due to adsorption. It might be well to look into a definition of this term. Thomas (8) states "The term adsorption is used to describe the phenomenon where a substance penetrates a liquid or solid structure, producing an intimate intermingling of its atoms with those of the absorbing liquid or solid.—When one examines the journal literature of colloidal chemistry, he finds that the term adsorption is applied to any phenomenon involving a change in concentration without an *obvious* primary valence reaction. For example, if the pressure of a gas is diminished by the introduction of a solid phase, if a vapor is condensed on a solid surface, if a liquid is imbibed by a porous solid, if the concentration of a solution is altered by the introduction of a solid, or if suspended particles adhere to solid surfaces, the term adsorption is used to describe the case." Notice, that in the above definition of adsorption, Thomas does not give this term to the precipitation of an electrolyte by a colloid.

We have very definite and positive proof that when the type colloid to which I refer in my paper, as published in National Petroleum News, is added to a water containing calcium or magnesium salts in solution, a combination with these salts is effected and a precipitation in the form of a gel is the result. This reaction, being similar to all colloidal reactions, does not proceed on a stoichiometric basis. This type colloid differs from tannins, starches and other purely protective colloids, which do not effect similar gel formations with these salts. Such a reaction provides the protective action required, and in addition goes a step further and precipitates the calcium and magnesium salts which takes it out of the realm of adsorption alone.

References

(1)—Wilder D. Bancroft—"Applied Colloid Chemistry." 2nd Ed., 1926. McGraw-Hill Pub. Co., N. Y., p. 309.
(2)—Graham. Jr. Chem. Soc. 15,246. (1862).
(3)—Freundlich, H. "Kapillarchemie."
(4)—Prof. Dr. Andor Fodor, "Colloid Chemistry" by Alexander, Chem. Cat. Co. N. Y., (1928), Vol. II, p. 369.
(5)—Prof. Dr. A. Lottermoser, ibid., Vol. I, p. 672.
(6)—Beans & Beaver Dissertation. Columbia Univ. (1921).
(7)—Alexander, J. "Colloid Chemistry." 3rd Ed. (1929) D. Van Nostrand Co., N. Y., p. 32.
(8)—Thomas. "Colloid Chemistry." 1st Ed. (1934) McGraw-Hill Pub. Co., N. Y. p. 272-273.

L. Drew Betz.

Car Adjustment

(*Continued from page R-469*)

testing that has been done at full throttle has been out of proportion to the importance of that operating condition, and has tended to divert our attention from the real issue. Continued testing without reconsideration of the problem has caused us to develop the impression that the anti-knock-requirement problem is the fuel-industry's own, rather than one of coordination between car manufacturers and fuel refiners.

CONCLUSION

Statements in this paper have dealt mainly with the engineering questions involved in the measurement of anti-knock requirements. Besides the engineering questions, there are, of course, other questions involving a complex fuel-price structure, the economic factors involved in cracking and polymerization, and other factors including established specifications and contracts. The anti-knock level is largely determined by such considerations, the engineering factors being somewhat secondary—not so much from deliberate neglect as from lack of information. However, a study of the engineering side of the picture may have some value in clearing away some of the cloudiness from the anti-knock-requirement problem.

So far as the data presented in this paper are concerned, no particular claim is made for their finality. However, it is believed that the proposed methods of approaching the problem give an understanding of it not given by the approaches formerly attempted. Much remains to be done before the complete solution of the problem has been raised from the depths of the pool of data and fitted together. It does seem clear, however, that the anti-knock requirement of the car is dependent upon the octane number of the fuel supplied to it. This is due to the flexibility of the spark-advance mechanisms and the setting of these devices built into the car by the manufacturer in order that his product may digest the product of the various oil refiners.

CORRECTION

Two small errors occurred in the manuscript of "Dehydrogenation of Lower Paraffins Over Activated Alumina Catalysts," published on page R-432 and following, in the Sept. 7th issue of Refining Technology.

In Table 3, column one, page R-436, the second line under "Propane" should read, "Average conversion to propene, %."

In the same table, the second line under "Normal Butane" should read, "Average conversion to normal butene, %."

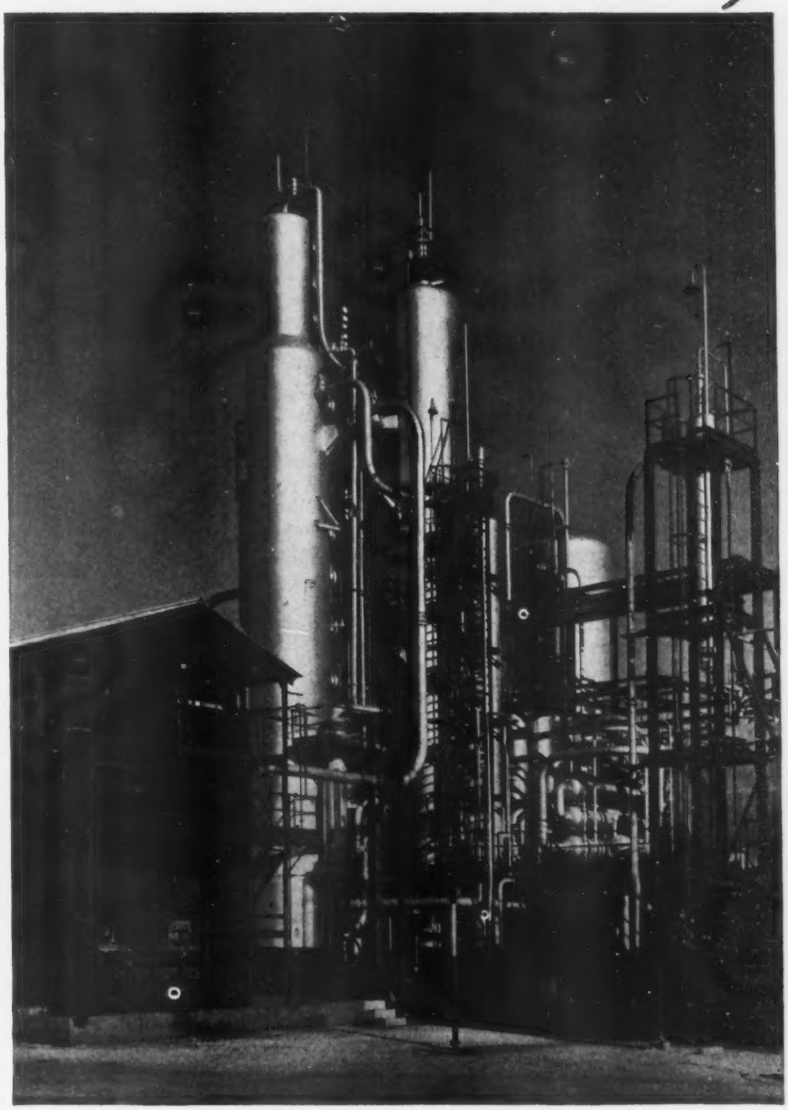
Readers will please make these corrections in their copies. Sorry—*Editor.*

CORRECTION

Referring to photographs reproduced on pages R-418, R-442 and R-443 of the Sept. 7th issue of Refining Technology, the plants shown therein are all Union Oil Co. of California plants, and not The Texas Co. and Richfield Oil Co. plants, as was erroneously stated in the captions to these photographs. Sorry—*Editor.*

20 LUMMUS LUBE OIL PLANTS —IN LESS THAN 4 YEARS

For major oil companies in this country and Europe, Lummus has designed and built 9 solvent refining plants and 11 Benzol-Ketone dewaxing plants in less than four years. » » » Among the dewaxing plants, the record of a 600 barrel per day Benzol-Ketone unit built for a Pennsylvania refiner is particularly interesting. Despite the handicap of winter weather, this plant was completed within six months. Neutrals of zero pour test were ready for shipment on the second day of operation. Stocks were switched from light neutral to heavy neutral, from heavy cylinder to long residuum, without difficulties or losses. » » » The most recently completed Lummus plant, a 3000 barrel per day Furfural unit, was built in less than six months—one week ahead of schedule. Twelve hours after starting up, this plant produced marketable stocks at full thruput. It operated thirty days on initial firing, when it was shut down for inspection purposes only. » » » We have some interesting data on the efficiency and economy of Lummus solvent refining and Benzol-Ketone dewaxing plants.



Courtesy of Gulf Oil Corporation

THE LUMMUS COMPANY, 420 LEXINGTON AVENUE, NEW YORK, N. Y. • 411 WEST FIFTH STREET, LOS ANGELES, CAL. • BUSH HOUSE, ALDWYCH, LONDON, W.C.2

LUMMUS

PETROLEUM REFINING PLANTS

ACS Chemists Report Important Advances In Gasoline Treating, Petroleum Analyses

PROBABLY one of the most outstanding features of the meeting of the Petroleum Division of the American Chemical Society, Sept. 5th to 9th in Milwaukee is the meticulousness of the procedure by which many major and some minor problems in petroleum chemistry are being attacked by different laboratories. Looking over the programs for the last several years, we are struck by the succession of papers appearing from year to year on different subjects. What amounts to series of papers by various groups of investigators have been appearing on these programs, following out definite lines of research. The value of these carefully pursued researches to the petroleum chemist and to our general, practical knowledge of refining is incalculable.

Treating of both light and heavy distillates has occupied much of the petroleum chemists' minds for some years, and recent advances have been revolutionary in chemical treatment of petroleum fractions. These investigations have been carried on in most instances by refining company research and experimental organizations, tackling problems which include the lowering of product quality because of undesirable compounds in the raw material, or the presence of which increases refining costs. Treatment of straight-run and cracked naphthas have received especially intensive study these last years. Four papers before this chemical meeting dealt with the relationships between treating methods and lead susceptibility, with sweetening of sour gasolines, and the removal of sulfur compounds to improve lead susceptibility.

Another phase of investigation is the study of properties of fractions, isolation of hydrocarbons and determination of their characteristics, and utilization of these isolated products in syntheses or otherwise. Four papers were given on the separation of groups of hydrocarbons from heavy petroleum fractions, and the chemical constitution and properties of these products so isolated. These papers were given by the group of men in the Bureau of Standards to whom has been given the stupendous problem of analyzing these heavy fractions, a work which will require many man-years of work.

Along these two main lines the petroleum chemists will explore, and on the results of their continuous work the petroleum chemistry and chemical refining of petroleum of the future will be built. They cannot build too well.

Just at present world affairs occupy much of the attention of all of us, chemist and layman. Entangled in a furious wave of "nationalism"—which, in the minds of some is merely a virulent form of racial or national egotism—European countries are making frantic and most expensive efforts at self-sufficiency, at providing within their own boundaries all the sources and materials necessary for their own sustenance. This effort has deranged commerce in a world where interchange of goods has always been the basis of prosperity and livelihood since caveman days.

In view of that it is interesting to read a survey of European conditions by Gustav Egloff, made during the early summer in most of the countries of Western Europe. Hunting for substitutes for petroleum fuel, petroleum being scarce in Europe with the exception of Rumania and Russia, Europe established an all-time record by producing non-petroleum substitute fuels amounting to 18% of their total requirements, Egloff finds. In 1937 this substitution cost Europe's fuel consumers a neat $235,000,000, and it is estimated the extra cost in 1938 will be more than $300,000,000. Power alcohol alone fell off in rate of consumption last year, a fact doubly interesting when considered in conjunction with the adverse verdict rendered by the Bureau of Chemistry and Soils on power alcohol and its practicability in this country. In Europe much of the alcohol was diverted to the manufacture of munitions, in preparation for the Armageddon toward which Europe seems rushing.

Hydrogenation of coal supplied Europe with nearly a million metric tons of substitute fuels, it is found. The two processes used are the I.G. thermal process for coal, and the Fischer-Tropsch process for carbon monoxide. Cost of production is reported from European sources by Egloff as 17 to 19 cents per U. S. gallon, a figure nearly as prohibitive in this country as that for power alcohol, when compared to a 4-to-5 cents cost for petroleum gasolines.

Compressed coal gas, methane and other light hydrocarbons supplied motor fuel to some 25,000 vehicles in Germany last year, taking the place of about 150,000 tons of gasoline. Italy substituted the same gases for about 40,000 tons of gasoline. Duty-free gasoline there cost about nine cents; these "bottled" gases cost from 41 to 61 cents per gallon equivalent.

Gas produced from wood, lignite, etc., replaced about 18 million gallons of gasoline, it is stated. Motor fuel from shale was produced at a price of 15 cents per U. S. gallon. Military strategy and preparedness is the only explanation given for these excessive costs, the additional burden on the people being an average of 32 cents per gallon of substitute fuel made.

Outstanding among recent technological advances is the low temperature sulfuric acid process for alkylation of olefins with isoparaffins developed by A. E. Dunstan and his collaborators. This process has been outlined before in these pages, and its possibilities for cheap production of 90-100 octane number super fuels are enormous, judging from the information so far available. Operating on refinery gases this process may be Britain's solution of the aviation super-fuels problem.

Sweetening of gasoline, and the removal of sulfur, or its conversion to less obnoxious forms has held the limelight for several years. In treating gasoline with sulfuric acid, F. G. Graves (Standard Oil Co. of California) finds that, as the anti-knock rating of the untreated fuel increases, the loss of knock rating by acid treatment is decreased, until, with a raw material knock rating in the high 70s, acid treatment actually increases the knock rating. This is considered to be a case of removal by the acid of lower octane number constituents. Graves shows a definite relationship between sulfur content and lead susceptibility, a cracked gasoline showing a susceptibility of 0.9 for a 0.1% sulfur content falling to a susceptibility of about 0.6 for 0.5% sulfur content.

Caustic soda washing removes much of the objectionable sulfur compounds in gasolines, L. M. Henderson, W. B. Ross and C. M. Ridgway (Pure Oil Co.) show, and caustic washing will thus have a better effect on lead susceptibility than doctor sweetening. Doctor sweetening converts mercaptans to disulfides, which remain in gasoline solution, and these compounds are proved to reduce lead susceptibility more than do mercaptans, these researchers

Knocking out

3 BIRDS WITH ONE STONE

DON'T let gum, acid corrosion, and anti-knock depreciation steal your gasoline profits the moment your back is turned. It's easy and economical to prevent such losses with Du Pont Gasoline Antioxidants.

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Many refiners are enjoying increased profits from higher yields through the use of Du Pont Gasoline Antioxidants. Write for complete information about the advantages of these products for gasoline stabilization. E. I. du Pont de Nemours & Co., Inc., Organic Chemicals Department, Wilmington, Delaware.

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GASOLINE ANTIOXIDANTS

Activities OF EQUIPMENT MANUFACTURERS

VALVES — Jenkins Bros. is announcing an advanced line of corrosion-resisting stainless steel valves regularly made of Cooper 18-8 S and 18-8 SMO each having a carbon content limited to 0.1 per cent. The expression 18-8 refers to 18 per cent chromium and 8 per cent nickel. Valves of other alloys will be considered on special order.

The valves are available in several styles: solid wedge or double disc gate valves, union bonnet or bolted bonnet regrinding globe or angle valves, and bolted bonnet "Y" valves. All are either screwed or flanged. Sizes range from ½ inch to 3 inches.

* * *

REGENERATING FURNACE—A large new Nichols Herreshoff roasting furnace designed especially for the regeneration of either fullers earth or bauxite has been installed at the plant of the Elk Refining Co., Falling Rock, W. Va., by the G. G. Brockway Co., Warren, Pa. Many new features are said to be incorporated so that nearly automatic operation is assured.

* * *

CAST IRON GUIDE — A guide to the selection of engineering specifications for grey cast iron to secure eight different properties has been published by The International Nickel Co., 67 Wall St., New York. The proven compositions outlined are said to have helped to elevate cast iron to a prominent position in the list of reliable engineering materials.

The Nickel Cast Iron Data is an eight-page, loose-leaf insert for 8½ by 11-inch ring books and is No. 1, Section 1, of a series which will later include specific applications to the petroleum industry, for example, and of specific grades such as Ni-Hard, Ni-Resist, and others.

* * *

Robert R. McCartney is now handling export and eastern coastal sales and engineering matters for Clark Bros. Co., manufacturers of engines and compressors, it is announced by Vice-President J. B. O'Connor. McCartney came from the Gulf Oil Corp. but had spent 10 years with Worthington Pump and Machinery Corp. following graduation from Pratt Institute of Mechanical Engineering in 1924.

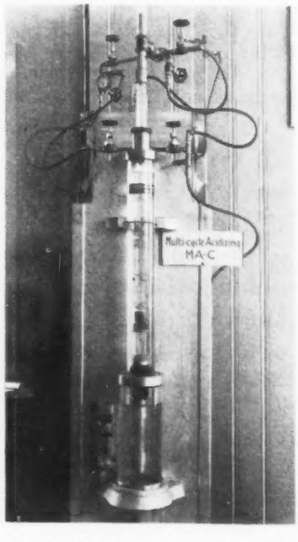
* * *

PYROMETER UNIT—The Lewis Engineering Co., Naugatuck, Conn., is offering a complete new low-cost pyrometer unit with accessories for temperature ranges up to 1800° F. A new type rectangular case contains a meter scale six inches long. Complete details are given in a circular available from the company.

* * *

A new district sales office is announced by Jones & Laughlin Steel Corp., Pittsburgh, for Houston. The corporation has had branch offices in Houston and Dallas for many years and the present staffs will be enlarged to cover the southwest territory, which will include Texas and New Mexico. F. D. Winslow, a newcomer to the J. & L. organization, has been appointed district sales manager. C. C. Noel will be in charge of the Dallas branch office.

* * *



Outer shells of Lucite made possible actual demonstration of Halliburton's Multi-cycle acidizing process

TRANSPARENT PARTS —Substitution of Lucite for metal in cases for demonstrating equipment employed by the Halliburton Oil Well Cementing Co. has been highly satisfactory, according to Vice-President C. P. Parsons. Not only was shown the movement of fluids, represented by water, through the various parts of the devices but pressures up to 150 pounds per square inch were imposed without damage. The material machined exceptionally well so that threads could be turned easily. Lucite is a methyl-methacrylate resin produced by E. I. du Pont de Nemours & Co., 626 Schuyler Ave., Arlington, N. J.

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find. Caustic-washed gasolines require less lead for a given octane number increase than do the same gasolines when doctor treated.

A properly designed doctor treatment system should include:

Addition of sulfur after a preliminary mix with gasoline and doctor solution; the use of sweetened gasoline through the sulfur drum; a rather long time, one minute, of contact between solution and gasoline, as in a baffled pipe, after adding sulfur; elimination of water wash, and of sand filter to remove lead sulfide; addition of solution of definite lead content at a constant rate, provision for doctor recirculation in handling high mercaptan gasolines with minimum emulsion.

These recommendations sum up the findings of Charles Wirth, C. D. Lowry Jr., and J. R. Strong (Universal Oil Products Co.) as the result of a comprehensive study of doctor sweetening and its effect on gasolines. It is notable that Henderson and his colleagues found the addition of excess elemental sulfur reduced lead susceptibility very seriously, hence the care in the amount of sulfur to be added, and the avoidance of excess. Some refiners add too much to hasten precipitation of lead sulfide and thus add unnecessarily to lead costs.

About 70% of the heavy petroleum fractions concentrated at the Bureau of Standards consist of naphthenes of from one to three rings, bureau investigators find. About 12% is composed of molecules of one aromatic ring and one to three naphthenic rings, with small amounts of sulfur and oxygen compounds. About 10% of the products are made up of molecules of two aromatic and two naphthenic rings, and the remaining 8% with more than two aromatic rings and one or more naphthenic nuclei, all associated with small amounts of sulfur and oxygen compounds. The separations have been made by very exhaustive vacuum distillations, followed by extraction with several solvents, acetone, sulfur dioxide, methyl alcohol and methyl cyanide being among those most frequently employed.

WATER TREATMENT CONTROL—Automatic pH recording and control instruments manufactured by Coleman Electric Co., 310 Madison St., Maywood, Ill., have been completely redesigned. The purpose of the redesign has been to combine the best practice in automatic recorders with the best practice in electronic amplifiers, and produce a compact assembly of units, according to the company announcement. The instrument employs the glass electrode.

* * *

GAS LIFT PUMPING — A new and economical method for gas lift pumping of oil wells is announced by The Fisher Governor Co., Marshalltown, Ia. The new Phil-neumatic pump operates on the principle of applying gas pressure on to the top of a trapped quantity of liquid within the pump and raising it to the surface with a low gas-fluid ratio.

At the surface, the gas supply is intermittently fed into the well so as to open the gas valve and put gas pressure on the tubing at a predetermined time when the oil chamber is filled up with oil. After opening and supplying gas pressure on top of the oil in the chamber, it will continue to feed this gas to the oil chamber until that chamber has been cleared of oil and the oil is carried to the surface. The intermitter then closes the gas supply valve and the residual gas pressure in the tubing and chamber escapes to the surface.

The new pump is run at the end of a string of tubing in the usual manner and is set in the hole at a depth below the normal fluid level in the well. The pump is available in five sizes from 5 3/16 inches outside diameter to 9 inches O.D. Bulletin No. 81, just off the press, describes fully the purpose, application and operation of the pump with illustrations.

* * *

HEAT WARNING—For closing an electrical circuit upon rise of temperature to a set limit, Bart Products Co., Bartlesville, Okla., has designed a Thermo-Safety device which is screwed into drilled and tapped hole in a bearing, water jacket or machine part to be protected. The electrical circuit operated by the thermostat may either operate a warning signal or stop the operation of the equipment endangered.

* * *

AGITATOR—An air-motor operated agitator designed to handle batches of material up to 100 gallons has been developed by the Eclipse Air Brush Co., 390 Park Avenue, Newark, N. J. Known as the Pneumix Type B, its speed is variable from 30 to 6000 r.p.m., requiring 5 to 50 pounds pressure. Quiet operation has been assured by a muffler in the exhaust line. Splash-proof performance has been provided by having two propeller blades "throw" toward each other. The upper propeller is removable so that the unit can be used on smaller amounts of material. The removable shaft is available in various steels and alloys to suit requirements. Overall size is 40 by 6 inches and weight is 17 pounds.

* * *

Heads Supply Company

J. L. Shakely of Tulsa is the new president of Frick-Reid Supply Corp., oil country subsidiary of Jones & Laughlin Steel Corp. He has been vice president of the supply company's operations in the west and his headquarters will continue to be in Tulsa

William M. Patterson retires from the presidency to become vice president in charge of the eastern division, with headquarters in Pittsburgh. Robert McCoy, Jr., who has been sales manager of the western division, was made vice president of that division, with headquarters in Tulsa

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(See also page 63)

Huge Savings Seen Through Arc Welding

CLEVELAND, Sept. 19. — G. M. Stearns, district production engineer, Cities Service Oil Co., Russell, Kan., received the largest award in the oil industry for a paper on welding, in the $200,000 prize program of the James F. Lincoln Arc Welding Foundation.

The award was $2543.88 for a paper on "Arc Welded Well Casings". This paper is said to demonstrate that use of arc welding in running casings would have saved $637,000 for five per cent of the oil wells completed in the U. S. in 1937.

The Jury of Award found that the total savings to industry by arc welding claimed by authors of all papers was $1,600,000,000. This figure was arrived at after discounting some enthusiastic claims.

In the oil industry subjects of papers for which authors received awards were: Well casings, reconditioning pipelines in service, an oil pump base, bubble trays, well drilling, a coking still shell, welding joints directly to drill pipe, new rotary machine, a wire line wall sampler, a production mast for well servicing rotary hose coupling, and an oil field slush pump.

An award of $712.28 went to the authors of a paper on an "Oil Pump Motor Base". John F. Muller and G. C. Munoz, American Pulley Co., Philadelphia, said this base could produce a saving to the petroleum industry of $16,000,000.

Phillip S. Ball and Justus O'Reilly, draftsman and assistant engineer respectively, Skelly Oil Co., El Dorado, Kans., received jointly an award of $508.77 for their paper on "Arc Welded Trays for High Pressure Bubble Tower".

A. M. Elder, engineer, maintenance department, Gulf Refining Co., Toledo, O., received $203.51 for a paper on "Redesign of Coking Still Shell for Arc Welding". The paper showed a saving of $109,350 per year available by improved design with welding. Among the honorable mention awards of $101.75 were L. W. Mosley, owner, Baker Oil Co., Huntington Park, Cal., and R. E. Hughes, district foreman, Standard Oil Co. of Louisiana, Oxford, La.

The grand award went to Mr. and Mrs. A. E. Gibson, president and stockholder, respectively of the Wellman Engineering Co., Cleveland. They received jointly $13,941.33 for a treatise on the elements required to assure the business and technical success of all. users of welding throughout the industry.

The Foundation's award program, which began 18 months ago, was judged by 31 engineering authorities from leading universities and colleges throughout the country. Altogether, 382 awards were made. Subjects of studies in the 44 divisions of the program represented practically every product and structure of industry, it is said.

G. M. Stearns, district production engineer, Cities Service Oil Co., Russell, Kan., won $2543.88 in the James F. Lincoln Arc Welding Foundation contest. The award was the largest for petroleum industry applications of welding. His subject was "Arc Welded Well Casings"

New Device Obviates Danger From Clogged Fuel Lines

Danger resulting from clogged gasoline lines in airplanes is said to be overcome by a device recently patented by Garfield A. Wood, Detroit, motor boat racer and designer. The moment fuel ceases to flow to the airplane motors, the system devised by Wood will open a new pipeline.

The patent provides for a Venturi tube mounted on a trap door in the wing of the airplane. By pulling a lever the Venturi tube pops out of the wing and is exposed to the onrushing air. Air which is forced through the tube creates a vacuum which is applied to a vacuum tank connected to the gasoline supply tank. Gasoline is drawn into the vacuum tank from whence it flows by gravity to the carburetor of the engine. Patent number is 2,123,295, issued July 12, 1938.

Designs Tiny Grease Tester

A tiny instrument holding less than a thimbleful of lubricating grease has been designed to measure the changes in consistency of the grease in small bearings. The device consists of a small cylinder to hold the grease and a light aluminum plunger in place of the heavy plunger in the standard method.

A unique feature of the design is that the cylinder is split into two halves permitting filling with grease with minimum air entrainment and softening. The new miniature penetrometer was described before the Division of Petroleum Chemistry of the American Chemical Society at Milwaukee recently. Co-authors of the paper describing the instrument are Gus Kaufman, W. J. Finn, and R. J. Harrington of The Texas Co. laboratory at Beacon, N. Y.

Symposium on Rubber

A symposium on rubber will be sponsored by the Committee on Rubber and Plastics at the fall meeting of the American Society of Mechanical Engineers, to be held at the Providence-Biltmore Hotel, Providence, R. I., Oct. 5-6. Papers presented will emphasize mechanical problems in the production and use of rubber.

Technical representatives of companies engaged in either the production or use of rubber and plastics are invited to attend. There will be an inspection trip through the Providence plant of the U. S. Rubber Co.

For "Good" Price for Oil

New Member of Railroad Commission of Texas Sets Forth His Views In Interview With NPN

By Lawrence E. Smith

N. P. N. Staff Writer

G. A. Sadler, new member of the Railroad Commission of Texas

The accompanying article is the oil industry's introduction, in the form of a personal interview, to the newly elected member of the Railroad Commission of Texas. Its three members hold immense powers over the oil industry, since they write the orders which govern the production of the state of Texas, which is about 40 per cent of that of the entire country.

What are the views of G. A. Sadler, the new member of the commission, on some of the current problems in connection with the regulation of crude oil output in Texas, on which he will soon have to cast his vote with those of two other members? NPN Staff Writer Lawrence E. Smith went to his law office in Longview to interview him on these and other points. He plans to work for stability in oil and gas production, he stated, since he believes that this benefits most his boss, the people of Texas.

LONGVIEW, TEXAS, Sept. 19 G. A. Sadler, commonly known as Jerry, observed his 31st birthday Sept. 8. He is a newcomer in politics and his election as a member of the Railroad Commission of Texas, to take office next Jan. 2 is his first public office, barring the brief time he worked for the state as a gasoline tax collector in East Texas.

We shall drop for the moment discussion of his achievements and experience. The oil industry is mainly concerned with what he thinks about his new job and what he is to do with it. The assertion has heretofore been made that no three men in the oil industry, or out of it for that matter, hold as much power over the industry as do the three members of the Railroad Commission of Texas. They write the orders which govern approximately 40 per cent of the production of the United States. If the orders are geared to the economic condition of the industry and reflective of the best practices in producing oil and gas, everybody benefits. Happily, most of the orders in recent years have approached these standards.

Mr. Sadler lost no time in asserting to this writer that he plans to work for stability in oil and gas. To be certain that we would make no mistake about it, we wrote down his words just as he said them:

"I was elected by the plain people," he asserted. "One-sixth of the population of this state depends directly on the oil and gas industry for their living. A majority of the rest benefit indirectly, bonuses and rentals on leases, royalties, sales of goods to those who work directly in the industry. The best way I can serve them is to help keep payrolls up and the best way to keep payrolls up is to have a good price for oil and gas."

How should this be done—what changes, if any, in current policies of the commission should be effected? Mr. Sadler ducked that one. He said he had a lot of studying to do between now and January and he didn't want to start popping off before he knew what he was talking about. He did believe, he said, that there had been too many wells drilled in the East Texas field and in some other places—too many exceptions to Rule 37, which is the spacing rule that applies to all fields of the state unless modifications are set out in orders or exceptions granted in individual cases. Also, he said, he thinks there have been granted too many special allowables, or production quotas.

This brought the conversation naturally to a somewhat delicate question. It was asked only after the interviewer had located the nearest exit and had prepared to run, not walk, to reach it. The question was what about the coming coalition on the commission. In recent years Col. Ernest O. Thompson and C. V. Terrell have thought alike and Lon A. Smith has thought otherwise and the ayes had it. The recent talk has been that it was Commissioner Smith's turn to have somebody voting with him.

Mr. Sadler took that one in his stride. His purpose in this respect, he declared, is to work to see that it is truly a "three-man commission," as that is what the taxpayers are spending their money to have.

"I will vote with Col. Thompson when I think he is right and I will vote with Mr. Smith when I agree with him," he said. "I hope that the orders will bear the signatures of all three members and I am going to do all I can to bring that about.

"I want to say this and I hope you will quote me. I think that Smith and Thompson are fine men and that they have served the state well. It will be a pleasure to work with them for the benefit of all Texans."

IMMEDIATELY after the run-off primary there was some talk and some of it got into the Texas newspapers to the general effect that a Smith-Sadler combination would be logical, as both are East Texans..

Mr. Smith, in all his public dissents to the actions of the majority of the commission, has listed heavily toward East Texas and a major ambition of his has seemed to be the procurement of bigger allowables over in that piney woods field which is near Henderson, his home town. Mr. Sadler lives in Kilgore—his law office is in Longview—and he is an East Texan by birth and choice of residence.

It was a natural conclusion, perhaps,

that the two would team up to the greater glory and welfare of the East Texas field. But Mr. Sadler asserts that he is out to serve all of Texas. He would make no assertion as to the present allowable of the East Texas field, which is nearly one third of that for the whole state. That, he said, was one of the things he would have to study.

But one point he emphasized by saying it three or four times. He is against "hot" oil.

The first one that tries to run any "hot" oil, East Texas or any other kind, will have to deal with the new commissioner, he said. He thinks there is a way around some of the difficulties of the past. The commission and the attorney general have fussed back and forth about how to do the job. The commission reports violations to the attorney general and his department is supposed to take the miscreants into court. The commission has complained that its reports have not always been followed by prosecution and the chief law officer has retorted that a lot of the commission's cases would not stand up in court. This has gone on for a long time.

Mr. Sadler says it isn't necessary to bother with the attorney general, if co-operation cannot be had. Complaints can be filed through the district attorney in the county where the violation of the commission's order occurs or through the district attorney in Travis county, wherein Austin is located. He will go the route prescribed in the penal code of the state, which provides among other things, prison sentence of two to five years. He, personally, will sign the complaints, he said, on "anybody that runs a barrel of 'hot' oil."

NOW, about that confiscation business. There is a lot of oil lying around in pits and in steel tanks in the East Texas field which has been filed on as illegal production and Texas has a law which says that the state can, through court action, confiscate and declare forfeit to the state and sell it to the highest bidder. Mr. Sadler thinks the whole mess should be cleared up, the oil gotten out of the way and then the commission could proceed without having to fight around all the time trying to keep track of the stuff. But he would do it in a different way than the confiscation-sales business has been handled in the past.

He thinks a board should be appointed consisting of two representatives of major companies, two independents and one "friend of the court." The task of such a board would be to establish the true value of the oil. In the recent controversy at Austin over further confiscation proceedings, the governor and others complained that there is no bidding and that the oil sells for too low a price. Mr. Sadler thinks that something near its true value could be realized. Once it was all out of the way, the commission's enforcement job would be greatly simplified.

Should the Connally law be renewed next year? Positively yes, Mr. Sadler thinks. "I praise that law and the Federal Tender Board most highly," he said. "I think there should be more such boards. They should be established in Oklahoma, Kansas, Louisiana —anywhere there are state laws that need reinforcing by stopping interstate movement of 'hot' oil."

One of the biggest questions before the oil industry of Texas is that of well spacing. It is a real problem, for the diversity of ownership and the abundance of small tracts in parts of Texas throws out of line the best planned development programs. Many oil men think it could be handled by basing the allowable production in part, at least, of a well on the acreage drained by the well, and what about that, Mr. Sadler?

That's another question that curled up and died. He said that was among the numerous things that he will have to think about and again he didn't want to be overspeaking himself.

Mr. Sadler wasn't considered a formidable opponent when he entered the race. But he got around. He says he made 984 speeches during the two campaigns and that he shook hands with everybody that attended his rallies. As proof, he exhibited a badly swollen little finger on his right hand. He employed a string band beating the Hon. Wilbur Lee O'Daniel into the field with this type of campaign argument by some 50 days, so he says. Neither ensemble has done anything to raise the music standards of Texans say some of the more finicky.

Texans went for the newcomers in politics in a big way this year. Mr. O'Daniel's biggest appeal in his campaign for governor was that he was not a "professional politician." After his nomination in the first primary, he reversed his field and urged the people to support a selected list in the runoff election, including Mr. Terrell, Sadler's opponent. Mr. Terrell has held some kind of public office almost continuously for going on a half century and can scarcely be classed as an amateur in vote-getting.

But the people stuck to their first idea and nominated Sadler, the novice. There is little record of campaign promises made. He used the radio and he made the aforesaid 984 public appearances. Showmanship, the fashion of the day, figured largely in the race and out in West Texas a real showman was going to bat for him. That was Harley Sadler, his cousin, a great public benefactor. Harley Sadler runs a traveling stock company, bringing the drama into the regions where entertainment is scarce and he has built quite a name for himself. He made short curtain speeches on behalf of Jerry Sadler and results were good.

The commissioner nominee was born in Kirbyville, which is down in the southeast corner. When he was a small boy his family moved to the old Sadler homestead in Anderson county, 21 miles east of Palestine. His great grandfather, Capt. W. T. Sadler, was the first white settler in Anderson county, so Jerry Sadler asserts.

He grew up on the farm, attended the one-teacher, all-subjects school in the vicinity. When he arrived at high school age he went to Houston and worked as a bell boy at the Rice Hotel to help out with expenses. He attended Stephen F. Austin Teachers College at Nacagdoches, running a suit pressing shop as the meal ticket.

He got a job with The Texas Co. at the Port Arthur refinery, working first as can inspector and later as lumber checker. In a few months he moved across the fence to the Gulf Refining Co.'s plant, where he spent five years in the laboratory. East Texas beckoned and after a brief period as gasoline tax collector, Sadler went to work for a local producing and refining company, getting room and board for his efforts. Before long he went into the business for himself, leasing an East Texas plant known as Tyreco No. 2.

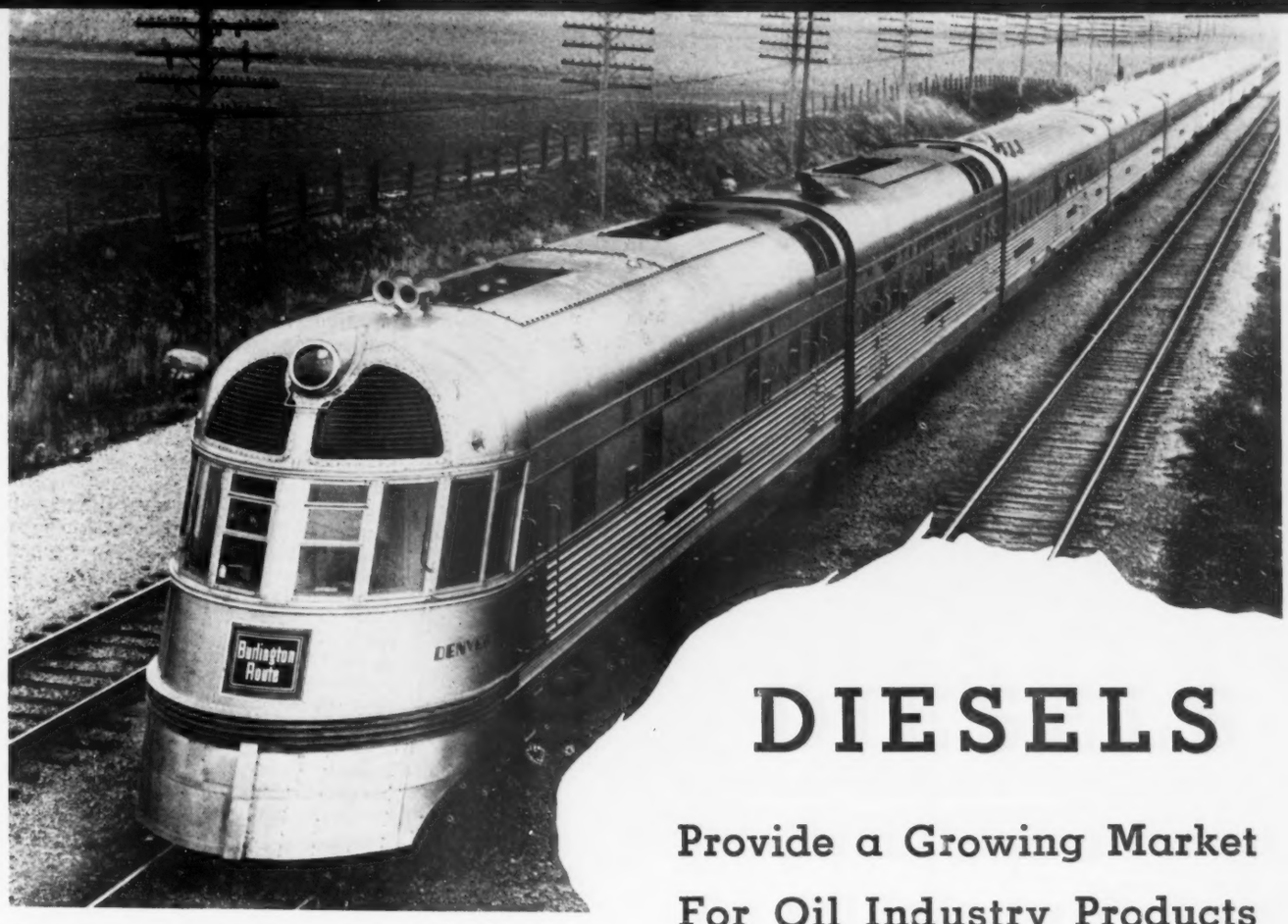
Night study resulted in his admittance to the bar of Texas in 1934, while he was in the refining business. He started practice in 1936. His present partnership with Fred Erisman, Longview, was formed the first of this year. Incidentally, Erisman, too, ran for office successfully this year and will be Gregg county's next district attorney. Mr. Sadler thinks that he and Mr. Erisman can do quite a little jointly at bopping the head of anybody who tries to run "hot" oil in the largest oil producing county of the U. S.

IMMEDIATELY after the returns were in there was a certain amount of agitated talk, for reasons previously recited. There was even talk that a new oil and gas commission should be established. Mr. Sadler ran a refinery in East Texas in the days when nearly all refiners in the field were suspect. So far as this writer recalls, the pages of citations and complaints—and there were thousands of such items—do not include the name of Sadler. He disposed of legend and gossip tersely when he told this writer, "I never ran a barrel of 'hot' oil in my life."

The talk is dying down and there seems to be a disposition to wait until the new man gets into office before passing judgment on him. At least to give him a chance.

Well, it will be a different scene, anyway, next January when the Railroad Commission holds its monthly hearing. Since June, 1932, the commission has consisted of Col. Thompson, whose tempo is about 200 paces to the minute, and Messrs. Terrell and Smith, majestic and glacier-like in speed. The new man, Sadler, will show more zip on the bases than either of Thompson's present associates; how many runs he will score is a tale of the future.

He is to serve six years and the per annum is $7500. Commissioner Smith has two years left of his term and Col. Thompson, four.



The Burlington "Denver Zephyr" is powered with diesel-electric engines developing 3000 horsepower. Diesel oil consumption averages approximately 1.82 gallons per train mile, or .55 miles per gallon. This amounts to 3771 gallons on the round trip of 2073 miles between Chicago and Denver

DIESELS

Provide a Growing Market For Oil Industry Products

By Jack N. Westsmith

N. P. N. Staff Writer

Development of the use of diesel engines in this country carries a two-fold interest for the oil industry, first, in providing a growing market for its fuel oil and lubricants and, second, a possibility of reduced transportation costs—by water particularly—in the movement of petroleum products themselves.

Efficiencies of diesel engines—despite their higher initial cost—are pointed out for various types of service. Railroads' experiences with diesel-powered locomotives, in switching service and for high speed passenger trains, are given and cost figures shown for various types of fuel.

This is the second article by this same author on the subject of the use of diesels, in railroad service particularly. In the preparation of this material, the author has ridden diesel trains—at times in the locomotive—and talked to railroad executives and visited the plants where the diesel engines are made. The first article appeared in the Aug. 31st issue of NPN.

WHAT does the very definite trend toward increased use of diesel engines, by industry, on the farm, and as motive power in the transportation field—including highway, marine and rail—hold for the oil industry today and in the future, both from the standpoint of additional sales possibilities and of faster and more economical transportation of products?

This question necessarily demands a broad answer, but several developments and applications of diesel equipment within the past few years serve to illustrate the growing market open to suppliers of diesel fuel and the possibilities for reducing transportation costs by use of diesel-powered transports, whether land or water.

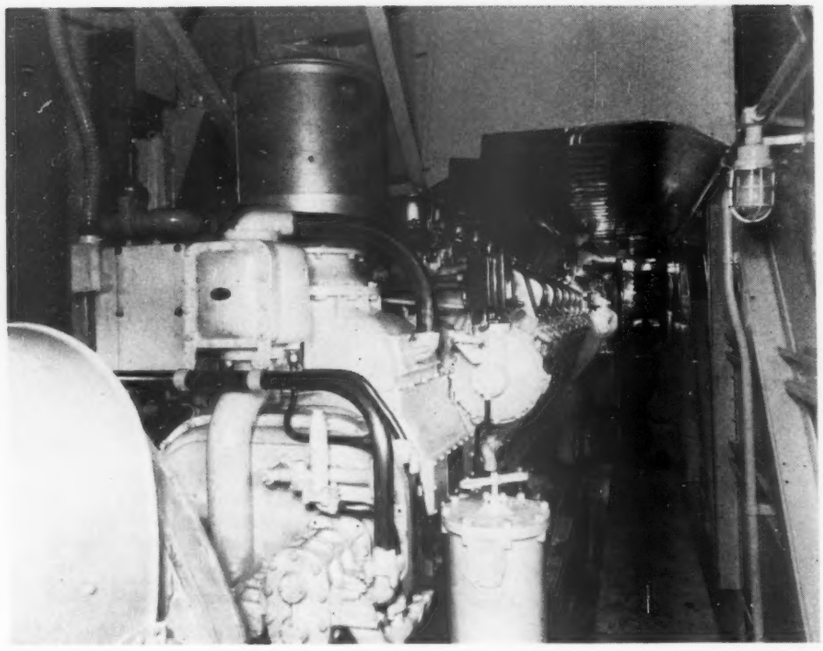
Favored by important advantages, not the least of which is lower delivered fuel costs, the large stationary-type diesel has already claimed its right to supplant coal-fueled installations in many industries and the outlook is for wider and wider application of this equipment.

Added to this outlet for petroleum fuel, however, is the important and comparatively recent development of relatively light-weight diesel engines suitable for use in trucks, buses, tractors, railroad locomotives, marine vessels and other mobile equipment. The surface has only been scratched in these uses, according to competent engineers and operators who point to the present tremendous increase in the operation of diesel engines.

Why has the new diesel found such favor? It is only partly true that the engine will run on cheaper fuel than gasoline or coal burning engines. At present, the fuel used is much the same as that required for domestic heaters —No. 2 furnace oil.

The price per gallon of this oil and of gasoline is almost the same at the refinery and the cost of coal to the railroads is particularly low. The big difference in delivered cost to the consumer lies in the lower cost of diesel fuel distribution and in the inherent operating advantages of the diesel engine.

In the first place, diesel engines are more efficient than either gasoline or steam engines, even when running at



Interior of the engine room on a modern diesel-electric locomotive. Built by Electro-Motive Corp., subsidiary of General Motors Corp., this engine is 12-cylinder, two-cycle, 900 horsepower, V-type. There are two of these in each unit, to give 1800 horsepower. The Santa Fe Super Chief has two units—3600 horsepower—and Union Pacific's west coast streamliners have three units—5400 horsepower

full speed and developing full power; and in the second place, they are more efficient when developing only part of their full rated power.

The real reason for the lower fuel costs of a diesel engine is not because it burns a cheaper fuel but because it obtains more useful work from the fuel. For example, six gallons of diesel oil will do the work of 10 gallons of gasoline on the same job and one tank car (8000 gallons) of this oil is equal to 12 cars (600 tons) of coal in switching service on a railroad—one gallon equal to 150 pounds of coal.

THERE is no prediction as to when diesel power will be applied to passenger automobiles, although experimental work now being directed in this direction points to the development of suitable engines in the not far distant future.

For trucks and buses, where long continuous service of upward of 50,000 to 60,000 miles a year offsets higher initial cost of the diesel engine—about three times as high as for comparable horsepower gasoline engines—this motor power has proved particularly adaptable.

But a passenger car, which is not used on the average more than 20,000 miles a year, would have to be driven five years before the savings in fuel cost would pay for the higher initial cost, as compared to gasoline power. Of course this may be altered by mass production and other factors affecting future diesel engine construction.

Weight, plus the initially higher cost of small horsepower diesels are factors yet to be solved in the manufacture of suitable engines for passenger car use. A six-cylinder diesel engine for trucks and buses weighs about 1635 pounds for a 160-horsepower unit, or about 10 pounds per horsepower and slightly less than the weight of a comparable 160-horsepower gasoline unit.

In smaller sizes the weight per horsepower is much lower for gasoline power. Engineers also point out that within the past 10 years automotive manufacturers working with the oil industry have doubled the amount of power a modern passenger car engine can get out of a gallon of gasoline.

If the same progress can be made in the next decade, it is thought possible that the economic advantages of diesel application to passenger cars may be materially reduced.

The high cost of diesel engines follows the inherent need for building them to withstand high pressures and the greater cost of the diesel injection system as compared with the carburetor arrangement used on gasoline engines. One of the principal factors contributing to the present price of diesel engines is the fact that their production is not yet on a mass basis.

Of particular interest to the petroleum marketer servicing territories open to bulk marine deliveries, is the application of light-weight diesels to barges, or motor vessels, for effecting fast economical distribution between coast supply points and coastwise or inland water-way consuming areas.

Success of such equipment on the Columbia River between Portland and The Dalles, Ore., has prompted west coast marketers to consider the possibilities of water transportation from the Los Angeles and San Francisco refining centers to points along the coast now served by truck or rail. This move is also influenced by mounting tariffs on overland transportation and by limitations placed on the quantity moved by land.

Although the plan is not past the discussion stage, proponents are reported considering the feasibility of a branch-line marine service, using diesel-powered vessels in connection with barges for navigating comparatively shallow water. It is estimated the savings in distribution costs would approximate one to two cents a gallon.

Such a development would inject into marine transportation some of the ideas so successfully applied by the railroads in the operation of streamlined, light-weight, diesel-powered trains to meet truck and air competition and to reduce operating expenses.

THE railroads, increasingly important customers of the oil industry over the past ten years, what with the development of gasoline-powered motor cars and oil-burning steam locomotives, illustrate the value to petroleum suppliers of the trend toward diesel operation in many industries.

Experience in this field, gained by nearly four years of gauging diesel performance, is outstanding in reflecting operating advantages and economies offered by diesel power, compared to coal and even oil in steam operation and in pointing to the probable future demand for diesel fuel.

Without question the greatest application of diesel equipment by the railroads has been in switching service, where it is a "natural" because of remarkable economy offered, higher availability, greater initial starting effort, superior efficiency, improved safety and work output, as compared to the steam locomotive.

The same also holds true for high-speed passenger service, although exact comparison with steam locomotives in similar service is not available, mainly because there are no steam-powered trains in comparable service. No steam locomotive in all railroad history has been called upon to make month after month, better than a 1000-mile run every day at schedules averaging more than 60 miles per hour.

However, in switching service the diesel is assigned the same job as the steam locomotive, so that a comparison can be made. In 1936, Class One railroads in the U. S. spent approximately $35,000,000 for fuel in switching service, exclusive of the cost of transporting the fuel over the lines of the purchasing railroad to the point of consumption and the return of empty cars. It is estimated diesel operation would reduce this fuel bill 75 per cent.

During the same year the railroads spent about $45,000,000 for repairing switcher locomotives, on which something like a 50 per cent saving is indicated with diesel equipment. An expense of $16,000,000 for enginehouse work on switchers, which includes cleaning fires, boiler washing, and government inspection, would be practically

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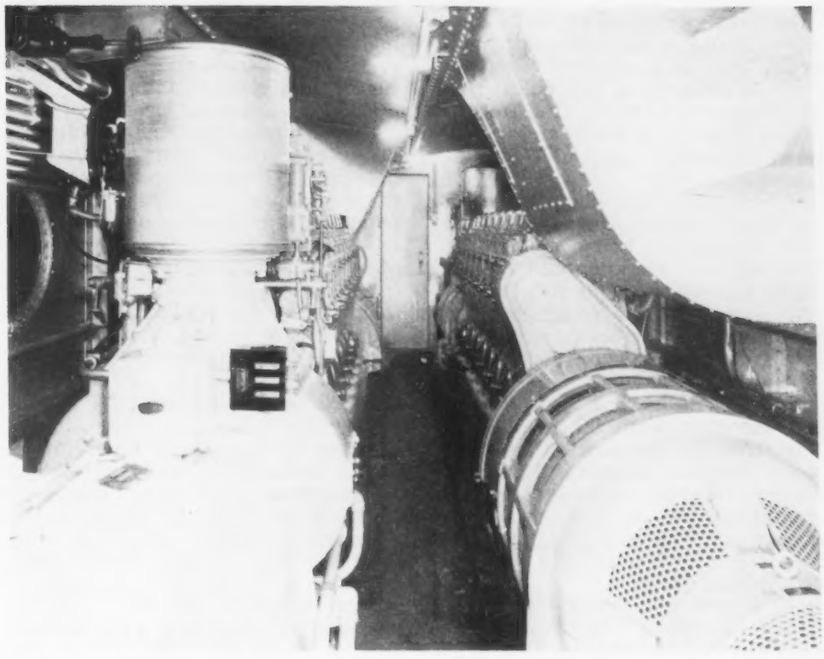
eliminated in diesel operation.

The rails also spent about $3,500,000 for switching engine water, an expense almost negligible with diesels. This is a particularly important factor in main-line operation where it is often necessary to haul water for the steam engine long distances, or where water must be treated before it can be used.

Furthermore, it is pointed out that, in substituting diesel for steam-powered locomotives, the capital investment would be no higher because three diesels will normally cover as many hours of service as four steam switchers.

In 1936, Class One railroads worked approximately 41 million switching hours at a total cost of $276,000,000. This operation involved the use of over 12,000 steam locomotives with an average age of over 23 years, of which only 8000 were designed for switching service.

It is of interest to the oil industry that, of the total hours worked by switching locomotives alone, 35,300,000 hours were with coal burning equipment. To have covered the same number of hours with diesel would have meant a fuel oil consumption of approximately 175,000,000 gallons, which at 4 cents a gallon amounts to about $7,000,000.



This auxiliary power plant on the Union Pacific's "City of Los Angeles" has two straight-eight, 600 horsepower, two-cycle diesel engines for developing electrical energy required, in the passenger cars for lighting, air conditioning, radio and miscellaneous appliances

A LUBRICATING oil consumption of about 4,500,000 gallons is also indicated, although this is influenced somewhat by the fact that general practice calls for this oil to be reclaimed when it is changed at periodic intervals of 10,000 to upward of 30,000 miles.

Important in diesel operation is the fact that the entire weight of the locomotive is carried on driving wheels with uniform torque exerted by an electric motor at each driving axle, giving the most effective return from the locomotive weight and producing high starting tractive effort. The diesel engine delivers full rated horsepower at all speeds, with the generated power reaching the driving axles through electric transmission.

Low-speed efficiency is particularly important in switching operations where the average speed rarely exceeds six or seven miles per hour. In the case of steam locomotives, on which the cylinders are direct connected to the driving wheels, only a relatively small proportion of the potential horsepower available at between 25 and 30 miles per hour is obtainable at these low switching speeds. It has been found that a 600-horsepower diesel switcher will often give better performance than a steam locomotive rated as high as 2000 horsepower.

Elimination of reciprocating parts and consequent hammer blows on the track, short rigid wheelbase, and uniform power application make the diesel locomotive much easier on the track and roadbed. The full effect of economies possible in this direction will not be realized, however, until diesel operation is 100 per cent effective on an entire line.

This brings up the possible application of diesel-electric locomotives to other railroad services. Expansion to fast freight movement is regarded as only a matter of time, following the success of this equipment in switching and in passenger service.

The speed at which this evolution occurs is dependent upon developments resulting from four years of passenger and switching experience and the necessary testing of a few large-capacity diesel units in actual freight movement.

Development of suitable diesel-electric locomotives for fast freight service is well under way, although preliminary experiments with this equipment in branch-line service—a combination of freight and passenger—may be an intermediate step in this evolution.

Although a complete changeover to diesel operation on all services is not even remotely indicated, in view of the reciprocity angle and the low delivered cost of fuel to the coal-carrying railroads, acceptance of diesel-electric efficiency and economy in switcher service is almost universal and the prediction is that all future purchases of locomotives for this use will be diesel.

Extension of diesel operation into all types of traffic by those railroads not closely allied with the coal industry, or where the freight haul on coal to the point of consumption is excessive, is an expected development of the future.

Some idea of the market offered for diesel fuel and an appreciation of the rapid growth in diesel fuel sales may be obtained from Table 1, which covers a report by the Interstate Commerce Commission, Bureau of Statistics, on fuel and power for locomotives and rail motor cars of Class One railways in the U. S.

This report shows that, while railroad consumption of coal, fuel oil, gasoline and electrical power was up slightly in 1937, compared to 1936, consumption of diesel oil nearly doubled. In the report covering operations for the first four months of 1937 and 1938, diesel consumption was nearly 2,000,000 gallons higher in the latter period, compared to a decline in consumption of other railroad fuel and power.

IN THE western district, covered by the report but not shown in this table, where the trend to diesel operation is most pronounced, approximately 28,500,000 net tons of coal were purchased in 1937 by rails operating in this territory.

While there is a lack of comparative data on the ratio of coal and diesel oil consumption in general road service—freight and passenger—it is estimated that about 40 gallons of oil would equal one ton of coal. On this basis, the western railroads would have required some 23,000,000 barrels of diesel oil to replace their 1937 purchases of coal.

Table 1 shows the average cost of diesel oil in the western district was 3.54 cents a gallon in 1937 and 3.52 cents in 1936. For the entire country the average price was 3.97 and 3.84 cents in the two years, respectively.

Some operating experiences of railroads using diesel-electric locomotives in railroad passenger service are of interest in indicating economies and performance. One of the earliest to try the new equipment was the Bur-

lington Lines, which put its first diesel-powered mainline train into operation May 26, 1934, on a non-stop run from Denver to Chicago—a rail mileage of 1034 miles—to establish the record breaking time of 13 hours and 5 minutes, at an average speed of 77.6 miles per hour.

By June, 1938, this company, with eight diesel-powered passenger trains, known as Zephyrs, had completed 5,000,000 miles of operation and carried 1,260,000 passengers. The two Denver Zephyrs averaged 129 passengers for every mile the trains operated in 1937.

This system operates on the average of about 16,000,000 miles a year with steam, gasoline-electric and diesel-electric locomotives, with the diesels approximating 13.5 per cent of the total mileage for the system. However, the diesels have proved so satisfactory in high-speed passenger service that the company has indicated all passenger trains will ultimately be propelled by this power.

E. F. Weber, superintendent of automotive equipment for the Burlington Lines, points out that diesel-electric power is preferable to the steam locomotive where the cruising speed is around 85 to 100 miles per hour. Compared to steam, the diesel has a much higher percentage of availability, is easier on the track and travels around curves with comfort and ease.

Whereas a steam locomotive must deliver its maximum output on practically every mile of its run in order to equal the on-time performance of the company's Twin Cities or Denver schedules, the diesel equipment makes these same schedules without apparent effort, Weber points out.

This ties in with one outstanding factor favoring the diesel, namely that it does not have to stop so often for fuel and water. On the 1034-mile run between Chicago and Denver, the Zephyr's fuel supply is replenished at Lincoln, Nebr. during the seven-minute standing time. Cooling water for the engine is also taken on here, although it amounts to less than five gallons per 1034-mile trip.

Another observation by this company in favor of the diesel-electric, compared to steam, is the possible reduction in weight. The Denver Zephyr, including a 3000-horsepower locomotive, is 1,334,395 pounds, or 444.8 pounds per horsepower. This compares with a total weight of 3,061,930 pounds on the Aristocrat, including a 4000-horsepower steam locomotive, or 765.48 pounds per horsepower. There is actually a 305,080-pound saving of weight in favor of the diesel locomotive, with the steam unit weighing 738,000 pounds and the diesel 432,920 pounds.

Fuel consumption of the 3000 HP diesel locomotive, including auxiliary power, heating boilers and traction, averaged 13.2 tons, or 3771 gallons of No. 2 furnace oil on the round trip of 2073 miles between Chicago and Denver. At 4.5 cents per gallon, this amounts to $169.69 for the round trip fuel bill.

Since the two Denver Zephyrs were placed in regular service Oct. 23, 1936, the fuel oil consumption has averaged approximately 1.82 gallons per train mile, or .55 miles per gallon. Of the fuel used, about 82 per cent goes to traction, 13.7 per cent to heat boilers and about 4 per cent for auxiliary power, including train lighting, air conditioning, radio and miscellaneous electrical appliances.

Cost of fuel and water for a steam locomotive handling a train of standard equipment over the same mileage amounts to about $419.53 in this company's experience, or $407.88 for 129.9

TABLE 1

Fuel and Power, Including Diesel, for Locomotives and Rail Motor Cars, U. S. Class One Railways

(From a Report of the Bureau of Statistics, Interstate Commerce Commission)

	UNITED STATES Twelve Months		UNITED STATES First Four Months	
AGGREGATES	1937	1936	1938	1937‡
1. Cost of fuel and power charged to yard and train service:				
Total charges for,				
Coal for steam locomotives	$198,953,973	$188,531,649	$60,882,528	$70,830,843
Fuel oil for steam locomotives	$58,998,195	$48,206,848	$17,239,143	$20,178,078
Electric current	$13,866,729	$13,352,246	$4,813,738	$4,824,181
Gasoline	$1,923,794	$1,858,619	$607,012	$610,266
Diesel fuel	$673,797	$419,162	$353,750	$217,752
Other fuels	$434,339	$397,128	$140,337	$148,718
Total	$274,850,827	$252,765,652	$84,036,508	$96,809,838
2. Quantities of fuel and power charged to yard and train accounts:				
Quantities consumed in yard switching service,				
Coal by steam locomotives (net tons)	12,821,407	12,541,946	3,902,953	5,255,142
Fuel oil by steam locomotives (gallons)	309,265,970	278,572,675	94,913,609	113,533,049
Electric current (kilowatt-hours)	70,863,019	58,565,119	23,931,300	25,518,700
Gasoline (gallons)	623,729	516,670	216,252	208,278
Diesel fuel (gallons)	4,927,303	3,500,311	2,540,909	1,752,356
Other fuels (equated net tons—coal equivalent)	16,168	16,068	5,471	6,034
Total (equated net tons—coal equivalent)	14,966,934	14,451,154	4,586,572	6,033,786
Quantities consumed in road freight service				
Coal by steam locomotives (net tons)	52,532,354	51,577,957	14,521,133	19,058,760
Fuel oil by steam locomotives (gallons)	1,577,973,810	1,436,988,295	438,044,116	556,704,556
Electric current (kilowatt hours)	450,093,896	440,514,028	140,270,083	159,954,028
Other fuels by steam locomotives (equated net tons—coal equivalent)	56,610	53,123	17,209	20,951
All other fuels (equated net tons—coal equivalent)	12,038	9,729	5,477	3,830
Total (equated net tons—coal equivalent)	63,312,946	61,457,038	17,506,196	22,862,945
Quantities consumed in road passenger service				
Coal by steam locomotives (net tons)	16,634,577	16,303,056	5,402,974	5,765,961
Fuel oil by steam locomotives (gallons)	666,484,114	612,128,415	209,527,108	227,159,947
Electric current by locomotives (kilowatt-hours)	516,720,687	496,970,042	186,829,855	186,806,673
Electric current by motor-car trains (kilowatt-hours)	590,268,314	573,737,080	207,442,912	214,654,894
Gasoline by motor-car trains (gallons)*	24,274,269	25,114,986	8,065,659	8,003,713
Diesel fuel by locomotives (gallons)	6,344,118	2,032,627	3,404,438	1,670,958
Diesel fuel by motor-car train (gallons)	1,522,360	1,490,700	574,253	539,604
Other fuels (equated net tons—coal equivalent)	21,790	20,079	7,688	6,820
Total (equated net tons—coal equivalent)	22,620,065	21,795,915	7,363,131	7,798,564
3. Quantities of all fuel and power purchased and produced:†				
Coal purchased f. o. b. mines (net tons)	88,721,897	89,142,286	24,242,000	34,239,788
Coal purchased f. o. b. points other than mines (net tons)	4,763,766	4,634,390	1,200,490	1,778,680
Fuel oil purchased (barrels)	68,102,599	59,821,591	18,765,723	22,562,798
Electric current purchased and produced (kilowatt-hours)	1,982,411,962	1,879,740,459	668,677,749	715,497,686
Gasoline purchased (gallons)	48,202,424	45,260,381	14,590,282	15,067,603
Diesel fuel purchased (gallons)	26,777,529	17,422,379	10,017,998	8,275,507
4. Total cost of all fuel and power at point of purchase and production:				
Coal purchased f. o. b. mines	$167,398,422	$159,251,696	$47,202,157	$61,825,423
Coal purchased f. o. b. points other than mines	$18,756,116	$18,064,102	$5,060,392	$6,806,474
Fuel oil purchased	$65,231,275	$51,768,259	$17,935,155	$21,589,179
Electric current purchased and produced	$17,603,295	$16,526,858	$5,991,074	$6,196,665
Gasoline purchased	$4,344,258	$3,917,007	$1,210,383	$1,337,122
Diesel fuel purchased	$1,062,482	$668,439	$459,195	$354,573
AVERAGES				
5. Average cost of all fuel and power at point of purchase and production:‡				
Coal per net ton (mine purchases)	$1.89	$1.79	$1.95	$1.81
Coal per ton (other purchases)	$3.94	$3.90	$4.22	$3.83
Fuel oil per barrel (42 gallons)	$0.96	$0.87	$0.96	$0.96
Electric current per kilowatt-hour	0.888c	0.879c	0.896c	0.866c
Gasoline per gallon	9.01c	8.65c	8.30c	8.87c
Diesel fuel per gallon	3.97c	3.84c	4.58c	4.28c

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tons of coal at $3.14 per ton and $11.65 for 200,864 gallons of water at 5.8 cents per thousand.

The savings in power cost, fuel and water, between the diesel-powered, light-weight streamline train and the steam locomotive pulling standard equipment is $251.62 in favor of the diesel on the 2073-mile trip.

If the steam locomotive is used to pull light weight streamline equipment, the cost of coal and water amounts to approximately $326.32 for the Chicago-Denver round trip—$318.08 for 101.3 tons of coal and $8.24 for 141,900 gallons of water—or still nearly twice the cost with diesel operation.

Dynamometer tests in the laboratory have proved that the two-cycle 12 and 16-cylinder diesel engines will develop rated brake horsepower on a fuel consumption as low as .37 pound per HP hour, burning No. 2 furnace oil of 18,500 B.T.U. per pound heat content.

Weber points out that in road service, however, where conditions are not always so favorable, .4 pound of oil per HP hour is considered a fair average. The engine will then have the following efficiencies: theoretical 41.45%, mechanical 83%, thermal 34.38%, transmission 80% and an overall efficiency from fuel to rail of 27.5%.

In comparison, a good gasoline burning engine for rail work will require .64 pound of fuel of 19,000 B.T.U. heat content per pound, for each HP hour at the engine shaft. Such an engine will have efficiencies of 24.65% theoretical; 85% mechanical; 20.93% thermal; 80% transmission; and 16.75% overall. This makes the net efficiency of the diesel better than the gasoline by 61 per cent.

Table 2 shows the lubricating oil and fuel oil specifications set up by the Burlington Lines for the Zephyr diesel-electric locomotives and illustrates that a good grade, run-of-the-mill fuel and "lube" oil will fill the needs of this equipment at present.

While it is possible that further developments in diesel engine construction may dictate improvements in the fuel and lubricating oil used, the equipment offered today has been designed to operate satisfactorily on products already made by the oil suppliers.

Engineers discount the possibility that additional processing or higher distribution costs on diesel oil, which might wipe out any difference in the per gallon price of gasoline and fuel oil, would ever wipe out the hourly fuel economy of the diesel engine. Certainly not when the cost of diesels is compared with the hourly cost of operating coal burning or oil burning steam locomotives.

Compared with a coal cost of $3 per ton which is a fair country-wide average, the price of fuel oil would have to rise to 23 cents a gallon before all of the diesel fuel economy is lost, these engineers say.

One effect of the complete dieselization of railroad systems would be to alter the fuel oil demand by these carriers, a demand now supplied by oil burning steam locomotives. It is estimated steam units using oil as fuel in switching service use about 60 gallons of fuel oil hourly as compared with an average of 4.5 gallons for diesels.

TABLE 2

Diesel Fuel and Diesel Lubricating Oil Specifications for the Burlington's Zephyr Trains

FUEL OIL SPECIFICATION

Flash °F.	150 Min. 175 Max.
Gravity	32–37
Pour °F.	—5 Max.
Viscosity @	100° F.—35 sec. Min.
Sulphur	0.5 Max.
End Point	10%—425° Min. 500° Max.
End Point	90%—540° Min. 620° Max.
Carbon Residue	0.05%
Water & Sedim't.	0.05%

LUBRICATING OIL SPECIFICATION

Gravity	26 Minimum 24
Flash	475° F. Min.
Fire	560° F.
Viscosity @	210°—80–85
Viscosity @	100°—1000 Max.
Pour	5° Max.
Color	3½—4 NPA
Carbon Residue	0.6% Max.

In 1936, according to Table No. 1, oil burning steam locomotives in switching service used 278,572,675 gallons of fuel oil and worked but 4,544,851 hours. Complete dieselization of switching by all railroads in the Class One grouping would have required only slightly more than 200,000,000 gallons of diesel fuel.

Nearly the same ratio of inefficiency is indicated with respect to oil burning road locomotives. In 1936, oil burning steam units in road freight service used 1,436,988,295 gallons of fuel oil. In road passenger service, such oil burners used 612,128,415 gallons, or a total for freight and passenger road service of 2,049,116,719 gallons.

Competent observers believe that, in the event of higher prices for fuel oil, the first reaction would be to eliminate oil burning steam locomotives with their excessive consumption. Furthermore, the probability exists that the savings in this direction would go a long way toward meeting the fuel oil requirements for complete dieselization of road and passenger service.

Oil Man's Firm To Recover Waste Steel Pickle Liquor

CLEVELAND, Sept. 17. — Through the administrative efforts of an oil man, the steel industry appears to have found a likely solution for one of its serious manufacturing problems—the pollution of streams with spent pickling acid.

As in the case of acid sludge disposal in the refinery, the problem of pickle liquor waste disposal is one which has caused legislators and steel men much concern for some time.

Recently a completely new process, which is expected to economically solve the spent pickle liquor disposal problem, has been announced by the Allied Development Corp. of Cleveland. The company is headed by W. W. Vandeveer, who is also one of the two founders of the Allied Oil Co., fuel oil distributor, and other Allied companies.

This new development is not an entirely new one for the Allied interests for, since 1930, the Allied Oil Co. has been marketing to steel mills a special inhibited sulphuric acid, which, in itself, is a refinery waste product, acid sludge.

The new spent pickle liquor process is covered by patents and is the result of intensive research work in a laboratory and pilot plant at Willoughby, Ohio, where the experimental work was done by Dr. M. J. Rentschler, H. Seymour Colton, and D. A. Williams.

The company claims that the waste pickle liquor is not only completely disposed of, but that it is transformed into a novel material possessing unusual insulating qualities and other useful properties.

The material obtained from the process is principally a co-precipitated iron hydroxide and calcium sulphate, and is to be known under the trade name of "Ferron." During its manufacture the material goes through a state where it is entirely plastic and can be molded to any desired shape which later becomes a rigid mass by a combined process of drying and oxidation.

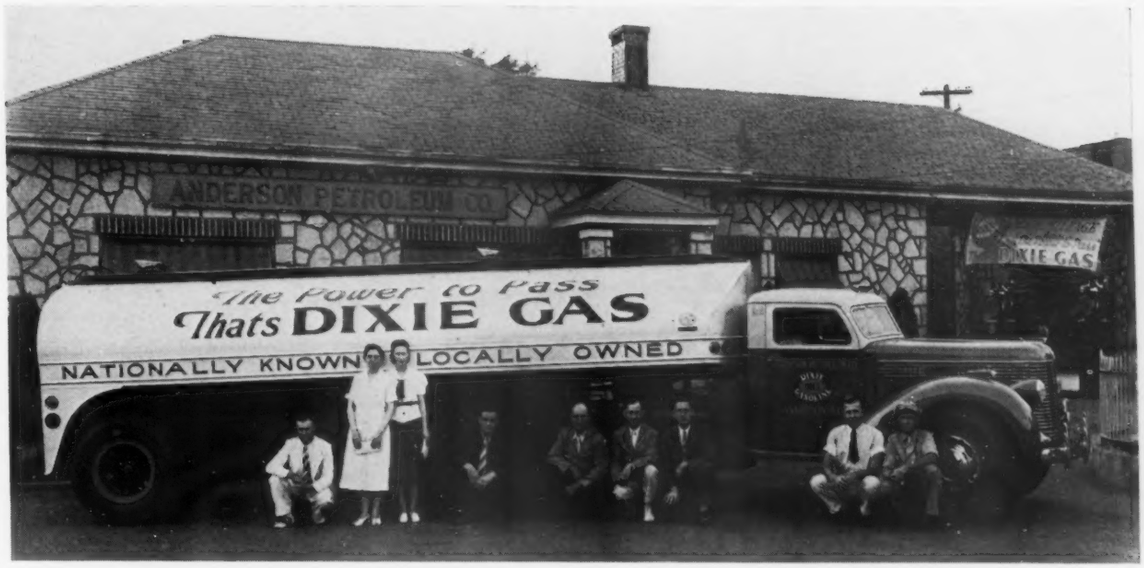
The processed material can be supplied in plastic form or as a solid or a powder, and can be sprayed on such places as boiler settings or other points where fireproof insulation is required.

The company claims the material has possible uses in the chemical industry, such as removing hydrogen sulphide and other sulphur compounds from gases and liquids. It is also claimed that tests now being conducted indicate the material can be used as a soil conditioner and secondary fertilizer.

The Allied Development Corp, has licensed the use of the process to the Sharon Steel Corp., and by Oct. 1 will have roughly 25 tons per day of Ferron for sale, according to company officials. Other steel companies will be licensed after the Sharon plant is in operation.

CLEVELAND, Sept. 17.—The 1939 convention and highway exhibit of the American Road Builders Association will be held in San Francisco during the early part of March, soon after the opening of the Golden Gate Exposition, according to C. D. Macpherson of Gar Wood Industries, Inc., Detroit, director of the association.

"DIXIE" COMES TO DIXIE



Bulk plant office and service station of the Anderson Petroleum Co. of Anderson, S. C., and in front the 4100-gallon transport truck in which the oil company brings in about 120,000 gallons of gasoline a month from Savannah, Ga., water terminal. In the white suit at the left is Frank R. Thompson, president and treasurer of the company. Others are the office force and transport crew

Two Independent Jobbing Organizations in the Southeast Active in the Promotion of the Brand Name of the Marketing Group Already Established in Many States

By G. T. Kellogg
N. P. N. Staff Writer

THE Dixie brand of gasoline, oils, greases and automotive equipment, already known to the motoring public in many states, is being pioneered in the southeast by two independent marketing organizations — the Dixie Distributors of Alabama and the Anderson Petroleum Co. of Anderson, S. C.

The marketing methods of these two companies are widely different and their methods of advertising and sales promotion of the Dixie brand name differ as widely. Both, however, realized that this brand name was a "natural" in their territories and that fact is credited by both distributors as being a large factor in their success to date.

The five jobbing companies in northern Alabama and southern Tennessee under one management, now operating as the Dixie Distributors of Alabama, changed to Dixie from another independent brand name, Red Hat. Old timers in gasoline marketing will recognize this as a brand name of a national independent marketers' organization of many years ago. The Anderson Petroleum Co. dropped a major company distributorship to fly the Dixie banner.

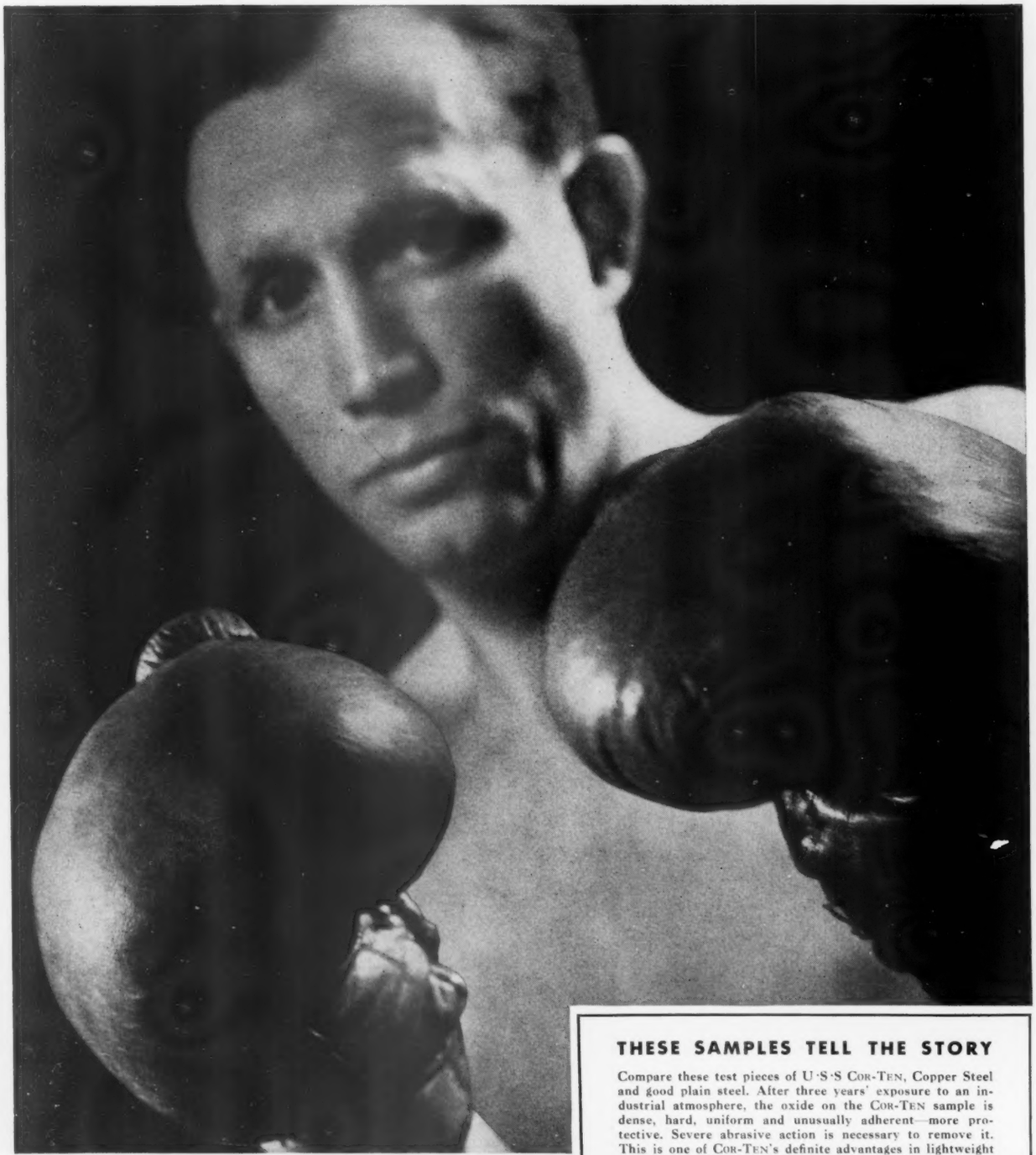
The Anderson company operates entirely out of one bulk plant, covering about 8 counties in northwestern South Carolina with some 25 tank trucks. The five Alabama-Tennessee companies operate out of five bulk plants, use only about a dozen trucks, and sell largely to country stores, many of them up obscure mountain valleys, or even up the sides of the mountains that rim the Tennessee Valley to the north.

It is the purpose of his companies, according to Sam H. Arnold, general manager of all of them, to have one "show" station in each town where they operate — for prestige — and to have other dealer outlets wherever there appears to be gallonage. These outlets include many mountain-valley stores.

Speaking of "mountain" outlets, one of Arnold's bulk plants, the Alabama Oil Co., of Hollywood, Ala., is located in a town whose most optimistic population rating could not go above 100 residents. Its two tank trucks cover mountain roads where their drivers sometimes have to resort to a shovel or an axe to clear the fallen trees from the highway. Yet the plant here does a 40,000 to 50,000 gallons a month business.

"I'd rather have 10 retail outlets selling 1000 to 1500 gallons a month than one outlet selling 10,000 to 15,000 gallons," Arnold said, explaining that competitors are more likely to try and get the larger outlets away from the independent company, and that the operator of the 10,000-gallon outlet is more likely to be always trying to get something more in the way of equipment, margin, or other favor, from the supplying company.

The Anderson company, which also has a number of so-called "bread-and-meat" accounts, agrees as to the de-



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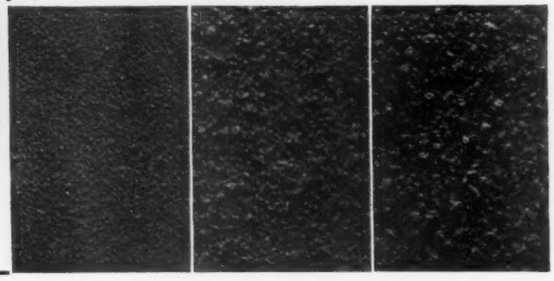

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TENNESSEE COAL, IRON & RAILROAD COMPANY, *Birmingham*

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* · United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

Interior of the stockroom of the Cash and Carry Garage, at Fayetteville, Tenn., an "experimental" station for the Alabama-Tennessee group of five jobbing companies which have taken on the Dixie line. Costs and profits for merchandise lines are worked out here as a yardstick for other stations. The Dixie accessory line will soon be stocked in this station

sirability of small, one-pump country-store outlets for this type of territory.

The five companies which make up the Alabama-Tennessee group were formed in 1923, to be independent distributors of petroleum products. Stock was sold in the area to finance them, and Arnold, then a pump salesman in the territory, was one of the buyers. Another was B. E. Holman, Fayetteville, Tenn., who now is president of all five companies. Arnold is general manager.

The companies started as distributors for a major oil company, but after a year or so, according to Arnold, their major-supplier sought to make them commission agents for its products and the management balked. It was then that they first started marketing under their own brand name — Alaco.

In 1926, when the Red Hat brand of the old National Petroleum Marketers Association was being pushed in all parts of the country, the Arnold group decided to swing over to that brand — under a set-up similar to the present Dixie organization.

The Red Hat brand name was on all globes of the Alabama-Tennessee group of companies from that time until last year. Arnold says he believes his companies were among the last in the country to market under the old Red Hat brand, and, as a matter of sentiment, he still has not replaced a few of his old Red Hat roadside advertising signs with Dixie signs.

In fact, one of the outlets of the Alabama Oil Co., in Huntsville, Ala., one of the five companies, balked at changing from Red Hat to Dixie. The dealer said his customers, mostly from rural districts, knew Red Hat and he might lose them if he changed.

The Arnold companies, which are five separate corporations only for bookkeeping and taxation purposes, did not have the same problem as the Anderson company when they went Dixie — that of substituting a brand hitherto unmarketed in their section for a nationally well-known brand.

It was rather the opposite, for while dealers under the Red Hat emblem often came to Arnold telling of a "half dozen" retail customers who "never heard of" Red Hat, he says they now come to him with the story of how a car with an out-of-state license drove in and its owner said; "This is the kind of gasoline I buy at home."

Arnold's dealers and lessees had been prepared for the change by receiving for two or three months previously copies of The Dixie Marketer, official publication of Dixie Distributors, Inc. They asked the tank truck men and the salesmen who came to their stations about Dixie, and nearly all of them seemed enthused at the proposed change, Arnold said.

The enthusiasm which Arnold and has aides have for the independent marketing plan under which they now operate permeates on down through the entire organization of the five companies, and the dealers, too, feel that they are a part of the new marketing set-up, Arnold says. The fact that Dixie is a better known brand than the old Red Hat has resulted in the companies' being able to get a better class of operators for the leased stations, Arnold says.

When Arnold's companies changed over to Dixie, they did not lose a single gallon of business — with either retail outlets or commercial consumers — he says, and since the change business has gained generally.

THE actual physical changeover, while it was largely accomplished last June, hasn't been entirely completed yet, although all stations except the one in Huntsville have Dixie globes and are selling Dixie gasoline. When the change was decided upon, Arnold hired a full-time sign-painter (who is still working full time) to begin spreading the name of Dixie over the countryside.

How well he has done it is attested by the fact that one can drive in any direction from any of the five points where bulk plants are operated and be reminded at least once each mile that Dixie Gasoline has the "Power to Pass", and that it is "Nationally Known — Locally Owned."

In each territory, the name of the local oil company is carried in addition to the Dixie emblem and slogan. In the Huntsville territory the signs point out that Dixie is sold by Alabama Oil Co. of Huntsville; in and around Hollywood and Scottsboro, it's the Alabama Oil Co. of Hollywood, and in the Gadsden area it's the Alabama Oil Co. of Gadsden. Across the line in Tennessee, the signs bear the name of the Con-

From this country bulk plant, located in a "side" valley of the Tennessee Valley, the Alabama Oil Co. of Hollywood, Ala., trucks to some 25 or 30 country stores with gasoline pumps, as well as to other service station outlets in the Scottsboro section, doing some 45,000 gallons a month business

sumers Oil Co., Winchester, or the Elk Oil Co., Fayetteville, depending on the location.

Arnold's advertising philosophy runs to road signs, because, he says, his customers' customers are motorists, driving along the roads and that's the best place to reach them.

The physical set-up of the five companies which comprise the Alabama-Tennessee group is likewise an important factor in their successful introduction of Dixie products. Each company is operated by a manager who is personally acquainted with each of his customers — the personal element. Although the bookkeeping and other office work for all five is carried on at Fayetteville, where Arnold lives, the customers feel that they are not dealing with a far-off, foreign set-up, but with their fellow citizens.

At all five bulk plants, the companies have storage capacity for 360,000 gallons of gasoline, divided as follows:

Huntsville and Fayetteville, 80,000 gallons each; Gadsden and Winchester, 70,000 each, and Hollywood, 60,000 gallons. Two tank trucks operate out of each bulk plant except Gadsden and Huntsville, each of which has three trucks.

EVERY outlet to every large storage tank in each of the bulk plants is equipped with a meter, the installation of which has enabled the company to cut losses from around 2 per cent to less than 1 per cent, Arnold says, in addition to a saving in time. This metering goes for tractor fuel, kerosine and other products, as well as gasoline. The Alabama plants do a considerable tractor fuel business, it is pointed out.

While lubricating oil withdrawals from storage are not metered, an equally efficacious method of checking has been developed in the bulk plants of the five companies, it was pointed out.

Each morning, large 55-gallon steel drums, one for each grade, are filled with oil. At the end of the day, while all truck drivers and others are in the warehouse, the drums are gauged by a stick. If the number of gallons shown on the delivery tickets checks with the gallons gone from the drum at this evening checkup, all is well. If not, the drivers cudgel their brains to remember that quick 5 gallons they drew to take to Jake Johnson's station, or somewhere else, without marking it down. The check-up every night has practically eliminated losses.

In addition to the five bulk plants, the Elk Oil Co. of Fayetteville owns and operates the Cash and Carry Garage, located on a busy corner in that town. Although company owned and operated, this garage is run on the same basis as a leased outlet and serves as the "experimental station" for the five-company set-up.

Manager "Jimmie" Lambert is billed for supplies just the same as if the station were a leased or dealer-operated outlet. Accounts are kept separately of costs and profits.

The object of the "experimental" station, Arnold says, is to give the company a standard to go by so that, when some of the leased or dealer outlet operators say "we can't" or "we can" do this or that, the company can go over the records of the Cash and Carry, apply them to the problem of the dealer, and show him whether he's right or wrong in saying he can't make money at such and such a margin, or that carrying such and such a product is uneconomic.

Operation costs of the station and garage are minutely kept, so that they may be used to prove or disprove arguments from any angle.

All the companies' bulk plant managers and nearly all other employes began their oil business training with the Arnold companies. "We don't want men who haven't the independent distributors' point of view," Arnold explains.

To get back to Arnold's philosophy of preferring many small retail outlets to a few large ones, he feels there is more security in the former. He says the companies try to have one large station in each of the 25 or 30 towns in which they operate, so that out-of-town trade will be impressed with the Dixie marketing set-up, but that the "bread and meat" accounts — country stores, etc. — are the ones which really bring in profits — because their cost of marketing is much less per gallon.

Also, the operators of these outlets are not always demanding new equipment, or some other special consideration, as are many of the big accounts. "However, we do have some big stations," Arnold says.

The companies buy mostly from Lion Oil & Refining Co., although the Gadsen plant gets a large part of its supplies from refineries in the New Orleans-Baton Rouge group.

Over across the mountains to the east, at Anderson, S. C., in a more thickly settled section than most of those in which Arnold's companies operate, the Anderson Petroleum Co., using some of the same, some different methods, has also been successful in introducing Dixie products — a brand new brand name. The Anderson company headed by Frank R. Thompson, dropped a nationally advertised major brand to affiliate with the Dixie organization, and, although it lost some of its gallonage with the change-over, it is regaining it now.

A good share of this company's supplies come into the 250,000-gallon bulk plant at Anderson (one of the largest in South Carolina) by transport truck from the Savannah, Ga., terminal where Republic Oil Co. brings in its supplies for that part of the country.

The advantage of transport trucking, Thompson says, amounts to about 0.6 cents a gallon. The rail freight rate from Savannah into Anderson is about 1.85 cents a gallon, whereas he figures he can bring gasoline in by transport truck at 1.25 a gallon, or less.

A service station of the Consumers Oil Co. of Winchester, Tenn., one of the five Alabama-Tennessee companys which have recently pioncered Dixie products in their territory

Thompson has just purchased a new 4100 gallon transport truck, which makes a daily round trip between Savannah and Anderson. Another transport of identical design will probably be purchased soon, Thompson says.

When the big truck comes in from the Savannah run, it backs up to the pump house at the Anderson bulk plant and is unloaded into any of the 13 tanks at the plant which may be desired. The truck tank has two compartments.

With a 4-stage pumping unit, capable of pumping 90 gallons per minute for each stage, the Anderson company is able to unload two tank cars and both compartments of the transport tank truck simultaneously, into four different tanks, if desired.

The Anderson Petroleum Co. was formed in 1930, to handle its own brand — Viking. Later it tied up with a major company, marketing in a small way under its brand name, then went over to the major company whose brand it dropped for Dixie.

Officers of the company include Frank Thompson, president and trea-

surer; James S. Beaty, vice-president; George H. Thompson, general manager; Alex T. Gettys, retail sales manager. Frank Thompson was formerly chief engineer for Standard Oil Co. of New Jersey, and later manager for northwestern South Carolina, a position he resigned to form his own company some years ago.

When the decision to go over to Dixie was made by the Anderson company, retail dealers, lessees and other accounts were told of the proposed change and asked if they'd like to go along. In most cases, Thompson says, they were agreeable, since many of them felt they'd been doing business with the Anderson Petroleum Co. rather than the major company, and were ready to accept the local company's recommendation as to the quality of the new brand.

THOMPSON went further in his advertising of the new brand than his contemporary across the mountains in Tennessee. Road signs he erected in profusion (he now has some 600 along the roads in the 8 counties of northwest South Carolina which he covers with the Dixie brand), but in addition he placed full- and half-page ads in the local newspapers. He bought time on the local radio station, purchased numerous advertising "gadgets" — flashlight keyrings; fans, for homes and churches; home thermometers; calendars, pencils — all advertising Dixie products, for distribution to customers and prospective customers.

In addition, he has sewn up sole fueling rights at the new Anderson Airport for Dixie gasoline. He is president of the Anderson Aeronautic Assn., a group of business men of the city interested in aviation and development of the city's airport, and because of his sole fueling rights, he has obtained permission to erect a fueling house at the airport, and to paint it, as well as the hangar, in the Dixie colors.

At the same time, he has retained Lieut. Howard S. Behr, U. S. A. reserve, manager of the Anderson airport, as "aviation manager" for Anderson Petroleum Co., and whenever possible, he gets the Dixie slogan hooked up in some way with airport activities.

An example; several months ago a "barnstorming" tri-motor plane landed in Anderson. Thompson contracted with it for the week or so it was there, painted Dixie signs on the sides, called it the Dixie Tri-Motor, and took up all of his dealer and consumer customers who wanted to ride.

At the present time he is using "spot" announcements over WAIM, Anderson radio station. Each hour, for nine hours each week-day and six on Sundays, the announcer gives the time and suggests that it's time "to refill with Dixie Gasoline."

While the Anderson company has some "country store" outlets, it has more "service station" outlets, by comparison, than the other Dixie jobbing set-up in the Southeast. It has several large "super" stations, largest of which, located on Anderson's main street, has an air-cooled, radio-equipped ladies lounge in the basement, among other features.

At another station in downtown Anderson, some 20 steel storage garages are maintained and, Thompson says, always filled. A third Anderson station has a trailer park behind it, equipped with electrical connections, and with a landscaped "front yard" for its guests.

The bulk plant at Anderson is landscaped with evergreen shrubbery, roses, neatly cropped lawns, a goldfish pool, whitewashed fences and carefully swept drives and yards. So meticulous is "the boss" about appearances that, if he spies a burned paper match, or a cigaret stub on the driveway 50 feet away, he will walk over, pick it up, and carry it to a conveniently located trash barrel.

One end of the office building at the Anderson bulk plant is a service station, leased to an operator, but because of its close proximity to "headquarters" it serves the Anderson company in much the same capacity as Arnold's Cash and Carry experimental station. Although located on a side street (a street which the company had to pave itself in order to cover the rough cobblestones), this station does a 6000 to 7000-gallon monthly business.

In addition to the petroleum products sold by the Anderson company, it has a distributorship for oil stoves and heaters, as well as for cook stoves burning range oil.

Three Dixie globes, illuminated at night, are part of this goldfish and lily pool in front of the bulk plant of the Anderson Petroleum Co. of Anderson, S. C. In the center grows a tropical tree and in front of it a small mill-house whose wheel turns by falling water. All Anderson company outlets are landscaped

Red Line Routes Tourist To Historic Spots

To promote tourist travel through its business and residential districts, the city of Monterey, first capital of California, has hit upon the ingenuous idea of painting a red line down the center of streets passing in front of, or near the principal historic buildings and sites of "Old Monterey".

Well in advance of each highway entrance to the city are two signs calling tourist's attention to this feature. For the fast-traveling motorist, the first sign calls attention to an important notice for tourists 100 yards distant, which reads: "Tourists, To see the most historic buildings of Old Monterey follow the red line. A round trip of less than 3 miles". In front of each point of interest is a marker indicating its historical significance. There are 55 markers in all. To the reader this historic trail in Monterey may appear to have little connection with the oil industry, but to service station operators in this city it has definite significance.

By actual count, 26 tourist-bent automobiles went over the three mile route in one hour on an off-season day, or a total of 78 miles, which, in terms of gasoline consumption amounts to approximately five gallons. Attendants at service stations along the route reported a steady stream of cars made the trip during the season, many of them stopping over for a day or longer to take in other interesting points at Carmel and Pacific Grove, which together with Monterey form "The Playground of California."

The importance of special and prominently advertised tourist attractions to oil marketing companies in this area is attested by the fact there are many more service stations than would be warranted by the "Playground" population of 25,000. One station operator said his gallonage more than doubled during the summer and winter tourist seasons and that he averaged three lubrication jobs more a day.

NAPHTHAS · FUEL OILS · DIESEL FUELS

KEROSENE · GASOLINE · INDUSTRIAL

AUTOMOBILE LUBRICANTS

BRIGHT STOCKS

Nine strategically located **SHELL** *Refineries*

CALIFORNIA

COALINGA, DOMINGUEZ, MARTINEZ, WILMINGTON

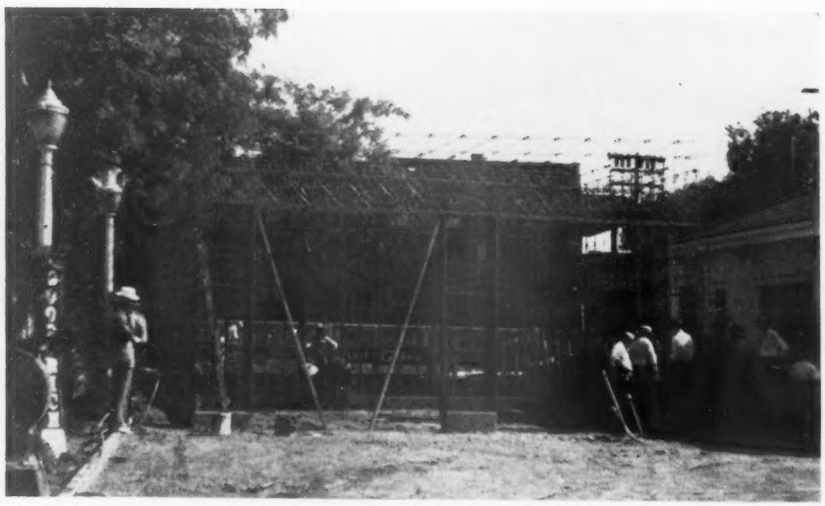
GULF COAST

HOUSTON, TEXAS; NORCO, LA.

MID-CONTINENT

EAST CHICAGO, IND.; WOOD RIVER, ILL.; ARKANSAS CITY, KANSAS

Welded Steel Rods Used In Station Structure



Putting the finishing touches on the welded steel rod structural sections for a two-bay service building at Studney's service station at Cleveland

Lining up one of the pre-fabricated welded steel rod sections used in the construction of a two-bay building at Studney's station, in Cleveland

The completed service building is shown here on the left. It is finished in cement stucco on the exterior and plaster on the interior

IT IS DIFFICULT to say, in recent construction developments, whether the service station has advanced the steel building or the steel building has advanced the service station.

Rapid erection, simplified section replacement, portability and salvage value—these are things which the all-steel building offers today and which fit the oil company's requirements admirably.

A newly formed Cleveland company is responsible for one of the newest developments in this field. It has just completed its first building for an oil company. Located in Cleveland, this building is a two-bay detached service unit for lubricating and washing cars, forming a new addition to Studney's Gulf Service.

The structural part, or skeleton, of the station is made of steel rods, clipped and welded together into sections at the fabricating plant. These sections faintly resemble the criss-cross of the fabricated steel truss.

The erection and anchoring of the sections of this first building of this type was completed in an 8-hour day. There were 11 wall sections and three roof sections to swing into place to complete the structural part of the building.

The building itself is 28 feet wide and 26 feet 8 inches deep. The ceiling height is 12 feet 4 inches, and the exterior wall height 14 feet 8 inches The bays are equipped with overhead doors, and provision is made to heat the building with a gas fired, unit heater.

The unique skeleton construction of the roof is designed to carry a weight of 137 pounds per square foot. Approximately 4¼ tons of steel were used in the construction of the building.

After the steel rod framework was erected and welded in place, metal lath was clipped to the interior and exterior walls. Plaster was then applied to the interior and cement stucco to the exterior. The entire building job was completed in 20 working days.

The fabricating company claims this type of construction is equally as economical as the cheapest type masonry construction—concrete block.

Does the enclosed lubritorium bring more business? The new building had been open only a week when this was written, and no announcement had gone out to the customers but in spite of that, the new building and lubritorium has brought an average increase of three lubrication jobs a day in the few days it has been open, it was said.

N.P.N. says this is an advertisement but we say it's National Petroleum News

"Clean Rest Room Campaign" No Novelty to This Jobber

DURING the past summer the leading oil companies of the Nation have been busily engaged in urging their dealers to "get 'em clean and keep 'em clean." Oil jobbers have swung in line with this campaign to raise the standards of cleanliness at service stations, and in general the motoring public has responded by showing a marked preference for the stations that have made a serious effort to keep clean.

Since they built their first service station in 1925, the Goplerud brothers of Osage, Iowa, have recognized that clean stations are good business. As the Goplerud brothers put it: "Clean rest rooms, as well as clean service stations and driveways, have been our theme-song ever since we began to serve the public. When a grease house was added to our original station ten years ago, we began a policy of keeping this grease house as clean as the rest rooms."

But these jobbers do not count on cleanliness alone to bring in the business. They add: "This policy of cleanliness, COMBINED WITH THE QUALITY PRODUCTS SUPPLIED US BY PHILLIPS PETROLEUM COMPANY, has put our Osage station in first place for gasoline sales. At our resale accounts and for our farm trade, we have found Phillips 66 products have the best acceptance."

There are six competitive bulk plants and 14 service stations in Osage, yet last year the Goplerud Oil Company sold 14 per cent of the total volume in their sales territory. They have sold both nationally advertised gasoline and unbranded "gas" during their 13 years in the jobbing business, but their final choice was Phillips 66 and they have stayed with that brand for the past 10 years.

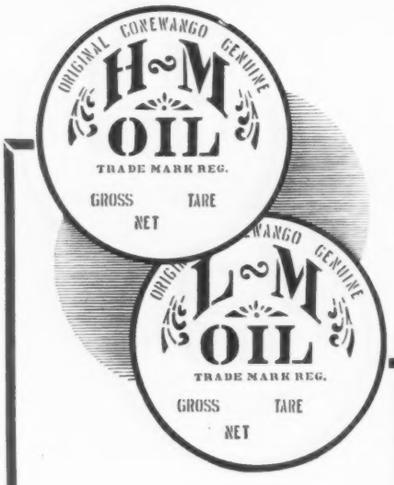
If you spent a lot of time cleaning up your stations this summer and still failed to increase business, let us explain the Phillips franchise. We believe we can show you how to get customers to come into your station so they can appreciate the clean rest rooms.

Write, wire, or phone.

PHILLIPS PETROLEUM COMPANY
Bartlesville, Oklahoma

Chicago Minneapolis St. Louis
Indianapolis Des Moines Omaha
Peoria Kansas City Wichita
Tulsa Amarillo

Spick and span service stations are an asset to any oil jobber—say Gerhard and Clifford Goplerud, of the Goplerud Oil Company



The Accepted Standards of Pennsylvania Bright Stock Excellence Since 1900

H-M and L-M Oils Are Made Solely By

THE CONEWANGO REFINING CO.

Warren, Pa.

New Equipment AND THE MANUFACTURERS

BATTERY VENDOR — A new and improved Exide "Automatic" vendor for dealers is announced by the Electric Storage Battery Co., Philadelphia. The vendor is a battery display arranged to show the customer the comparative value in life and power of three types of Exide batteries that fit one car group. The object of the vendor is to enable the dealer to "sell-up" with the minimum of effort on his part. Exide announces that, since the introduction of the "Automatic" vendor, average dealer profits per battery for the popular makes of cars have increased 28 per cent.

* * *

AIR CONDITIONING UNIT — A new model of a Gar Wood Tempered-Aire Unit, co-ordinating oil heating and winter air conditioning, has been announced by Gar Wood Industries, Inc., Detroit. The new unit, known as Model 101, is said to incorporate a new way of mixing oil and air to produce a sunburst flame of high heating efficiency and quiet, clean combustion. The air for the burner, instead of being forced directly through the jet and ignition tube assembly, enters a specially constructed air chamber which surrounds the burner tube and, under constant stable pressure, is discharged across the end of the ignition and jet tube assembly rather than through and out of the tube.

* * *

BATTERY YEARBOOK — The National Battery Manufacturers Assn., 7 East 44th St., New York, has just announced the publication of the fourth statistical yearbook of the industry. The booklet contains information regarding trends in motor transportation, motor car production and prices of raw materials, as well as statistical data of the battery manufacturing industry.

The books are available at 25 cents each for single copies, with discounts on larger orders.

* * *

The fourteenth annual convention of the National Battery Manufacturers Assn. is scheduled to be held at the Sherman Hotel, Chicago, Oct. 27-28. A two-day business session is planned, according to the announcement.

DRUM PLANT — A new steel drum manufacturing plant will soon be in operation at Port Arthur, Texas, by Wilson & Bennett Mfg. Co. This is the fourth manufacturing unit of this company. Three plants have been equipped and put into operation in the last five years. The plant will produce a complete line of drums and barrels.

Say It's 'Dubbscracked' Jobbers Are Told

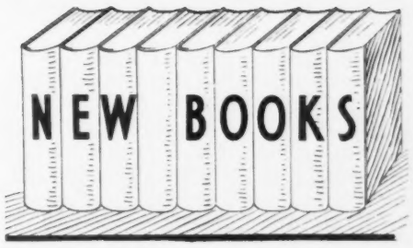
CHICAGO, Sept. 17. — The story of Dubbscracked gasoline, in terms of merchandising value for oil marketing companies, is told in a booklet by the Universal Oil Products Co., Chicago, currently being distributed to 11,000 independent oil jobbers over the country.

"Better Business For Independent Oil Jobbers" approaches cracked gasoline from the merchandising possibility angle, rather than the technical aspects, talking of the jobber tieing his own name with that of Dubbscracked gasoline.

The independent jobber today can command an outstanding product and name to use with his own brand name to increase the public acceptance of his motor fuel, the booklet states. It describes and illustrates the advertising of several oil companies which have featured that they were selling a Dubbs processed gasoline.

The booklet relates the rise of cracking and tells how the notion that cracked gasoline was an inferior motor fuel changed with the rise of the high compression automobile engine so cracked gasoline became a premium fuel. The booklet also takes up the mileage factor of cracked gasoline, also the ever increasing supply of Dubbscracked gasoline.

"You will find superquality, two-named gasoline (your own and Dubbscracked) as popular with your customers as prime two-name commercial paper is with your bankers," independent oil jobbers are told.



"About Petroleum"

To give a general idea of the workings of the petroleum industry, without discussing the solution of its problems, J. G. Crowther has written "About Petroleum" as a "simple account" to "bring a field for productive discovery to the notice of many who may not yet have become acquainted with its fascination and further promise."

The author points out that many want to get some idea of what petroleum is, where it comes from, how it is got, and how it is transformed into the gasoline they buy at the pump island and other liquids for which they have use.

Written in the characteristically straightforward and simple style so often found among English writers, the book should be of considerable interest to high school and college students as an introduction to more advanced studies or for the broadening of their general fund of information about present day industries.

There are 22 chapters in this 181-page book. Starting with the origin of petroleum with the two leading theories of its natural formation, it continues through high spots of history of the uses of petroleum, output and resources, elementary chemistry, the search for crude by various methods, drilling, pipelines, refinery processes, and finally the refinery products themselves—lubrication problems, engine knock, helium and carbon black.

An index of seven pages has been provided. Publication date for the new book is Sept. 22 and the price is $2.25. The book will be published by the Oxford University Press.

George Locke Is Rancher

LOS ANGELES, Sept. 17.—George D. Locke, retired vice-president of Barnsdall Oil Co. and former president of the Western Petroleum Refiners Assn., is now located at Rancho, Santa Fe, Cal. where he has purchased a small ranch and is engaged in raising avocados. The ranch was bought on account of Mrs. Locke's health and she is improving rapidly in this climate, Mr. Locke states.

Made Office Manager

SALT LAKE CITY, Sept. 15.—John N. Fraser, Paramount-Pingree Oil Co., with headquarters here, has been promoted to assistant secretary and general office manager. The company operates 38 service stations and nine bulk plants through Utah. A. H. Ehler is president.

More Payload - Less Weight - Ample Safety

FOR bulk haulers whose chief concern is ABSOLUTE MAXIMUM GALLONAGE CAPACITY, Fruehauf adds to its regular line of Tank-Trailers a NEW "FEATHERWEIGHT" LINE—featuring both frame-integral and frameless units.

4000 OR MORE GALLONS

Specifically, Fruehauf's "Featherweight" Tank-Trailers are designed to haul 4000 or more gallons—with an average-sized tractor—in states where gross weight is limited to 16,000 lbs. per axle and 40,000 lbs. per train.

Although all surplus weight has been eliminated from both tank and frame in order to boost payload capacity to the limit, ample allowances have been made for the safety factor. These "featherweight" units are built to give long years of satisfactory service.

Still available, of course, is Fruehauf's regular line of Tank-Trailers. So that no matter what your haulage problem, you'll find the answer in one of Fruehauf's many models.

CALL IN A FRUEHAUF MAN

Next time you're ready to buy new equipment, be sure to call in a Fruehauf man and learn what "Engineered Transportation" can do for you. Meanwhile, count the Fruehaufs on the road. Judge by what others are doing!

World's Oldest and Largest Manufacturers of Truck-Trailers

FRUEHAUF TRAILER COMPANY

10918 Harper Avenue - - Detroit, Michigan

Sales and Service In Principal Cities

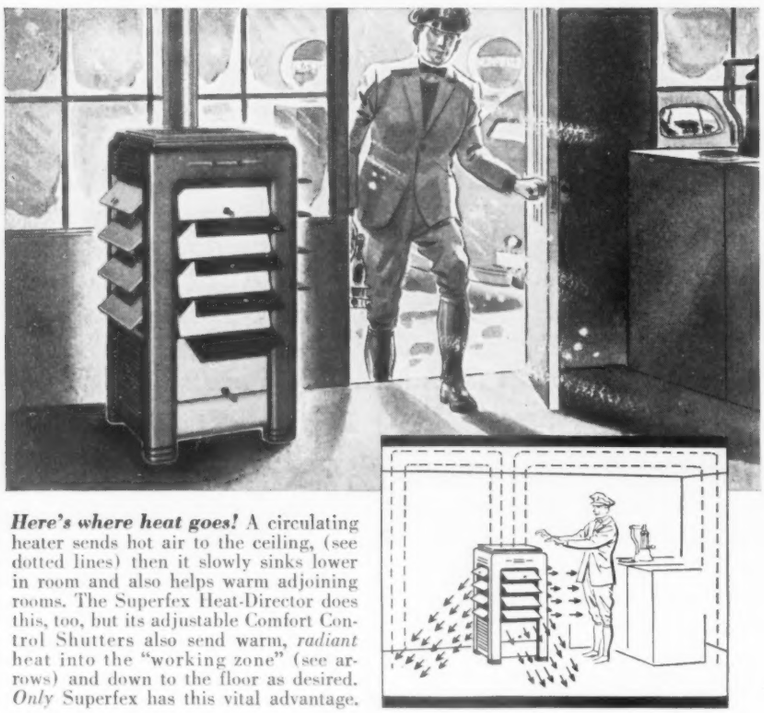
FRUEHAUF TRAILERS

"Engineered Transportation" REG. U.S. PAT. OFF.

FRUEHAUF TANK-TRAILERS BOOST PAYLOADS—CUT COSTS

IF YOUR MEN WORKED AT THE CEILING · · · CIRCULATED HEAT ALONE, WOULD BE O. K.

But..for warmth in the "working zone," you need directed radiant heat . . . supplied by the SUPERFEX Oil Heater!



Here's where heat goes! A circulating heater sends hot air to the ceiling, (see dotted lines) then it slowly sinks lower in room and also helps warm adjoining rooms. The Superfex Heat-Director does this, too, but its adjustable Comfort Control Shutters also send warm, *radiant* heat into the "working zone" (see arrows) and down to the floor as desired. *Only* Superfex has this vital advantage.

THE Superfex Heat-Director operates hour after hour without attention. Heat can be accurately regulated by merely turning a dial. Thermostatic control for overnight heating and special attachment for providing hot water radiation in washroom are available. No odor, no soot. And economical, for it burns a wide variety of inexpensive fuel oils. Permanent connections for use with outside fuel storage can be had. Sizes and models to fill every service station need. Full information on request—send the coupon.

•

Operators of stations requiring central heating have found the answer to their requirements in the Superfex Oil Burning Air Conditioning Furnace.

RADIANT HEATERS, TOO
Superfex Radiant Heaters are available in several sizes for use where radiant heat only is desired.

SUPERFEX
OIL BURNING HEATERS
A PRODUCT OF PERFECTION STOVE COMPANY

The Mark of Quality

PERFECTION STOVE COMPANY, 7614-B Platt Avenue, Cleveland, Ohio

Please send descriptive booklets as checked:
- ☐ SUPERFEX Heat-Directors and Radiating Heaters
- ☐ PERFECTION Portable Room Heaters
- ☐ SUPERFEX Oil Burning Air Conditioning Furnaces

Name_____ St. or R. F. D._____

Post Office_____ County_____ State_____

NEW PATENTS

Compiled by R. E. Burnham, patent and trade-mark attorney, 511 Eleventh Street, N. W., Washington, D. C., from whom copies may be obtained at the rate of 25c each. State number of patent and name of inventor when ordering.

August 30, 1938

REFINING

Gas conversion—Horace B. Cooke, Clarendon, Va., assignor to Process Management Co., New York, N. Y. Filed Apr. 16, 1936. No. 2,128,220.

Decomposition of hydrocarbon oils—Harold R. Snow, Hammond, Ind., assignor to Standard Oil Co. (Ind.) Filed Feb. 14, 1930. No. 2,128,502.

Process of producing asphalt in solvent refinement of petroleum substances—John W. Poole, Jaffrey, N. H. Filed Sept. 1, 1934. No. 2,128,885.

MISCELLANEOUS

Liquid dispensing (gasoline type)—Bjornulf Johnsen, Summit, N. J. Filed Dec. 15, 1937. No. 2,128,299.

Liquid dispenser (gasoline type)—William J. Peter and Basil J. Yanchenko, New York, N. Y., assignors to Aqua Systems Inc., same place. Filed June 29, 1936. No. 2,128,499.

Process for lubricant composition—Adrianus J. van Peski and Willem Coltof, Amsterdam, Netherlands, assignors to Shell Development Co. Filed Oct. 19, 1936. No. 2,128,574.

Wax acid soap and process of making—Carleton Ellis, Montclair, N. J., assignor to Standard Oil Development Co. Filed Sept. 7, 1935. No. 2,128,083.

Condensed blending agent and lubricant—Peter J. Wiezevich, Elizabeth, N. J., assignor to Standard Oil Development Co. Filed Sept. 28, 1934. No. 2,128,109.

September 6, 1938

REFINING

Conversion of hydrocarbon oils—Charles H. Angell, Chicago, Ill., assignor to Universal Oil Products Co. Filed Mar. 17, 1933, and Oct. 30, 1937. Nos. 2,128,897 and 2,128,898.

Revivification of clay and like—Seymour W. Ferris, Aldan, and Henry C. Cowles, Jr., Philadelphia, Pa., assignors to Atlantic Refining Co. Filed Apr. 14, 1936. No. 2,128,931.

Refining mineral lubricating oils—Martin Mueller-Conradi and Robert Uloth, Germany, assignors to I. G. Farbenindustrie. Filed Apr. 26, 1934. No. 2,128,958.

Treatment of still residue, and treatment of heavy oil—William H. Carmody, Dayton, Ohio, assignor to Neville Co. Filed Jan. 24 and 28, 1935. Nos. 2,128,984 and 2,128,985.

Process for treating synthetic benzine products from hydrogen and oxides of carbon—Franz Fischer and Herbert Koch, Germany. Filed July 10, 1935. No. 2,128,994.

Oil cracking tube lining—William T. Hancock, Long Beach, Calif. Filed Mar 4, 1935. No. 2,129,174.

Conversion of hydrocarbons—Joseph

P. Furlong, Jersey City, N. J., assignor to Amarel Corp., Newark, N. J. Filed July 21, 1936. No. 2,129,269.

Refining mineral lubricating oils—James M. Page, Jr., Casper, Wyo., assignor to Standard Oil Co. (Ind.) Filed Feb. 17, 1936. No. 2,129,282.

Method of hydrocarbon oil conversion—Albert P. Sachs, New York, N. Y., assignor to Petroleum Conversion Corp. Filed Sept. 28, 1937. No. 2,129,506.

Method of and apparatus for heating oil or petroleum to elevated temperatures—Frank H. Praeger, Tulsa, Okla., assignor to Alcorn Combustion Co., Philadelphia, Pa. Filed Nov. 22, 1930. No. 2,129,589.

Manufacture of improved lubricating oils—Wolfgang Grote and Alfred Hoppe, Germany. Filed Jan. 12, 1935. No. 2,129,616.

MISCELLANEOUS

Preparation of resinous reaction products of sulphur dioxide and olefines—Louis H. Fitch, Jr., and Frederick E. Frey, Bartlesville, Okla., assignor to Phillips Petroleum Co. Filed Mar. 16, 1932. No. 2,128,932.

Process of producing beta olefins—Robert D. Snow, Bartlesville, Okla., assignor to Phillips Petroleum Co. Filed July 29, 1935. No. 2,128,971.

Motor fuel—Leo M. Christensen, Atchison, Kans., assignor to Chemical Foundation, Inc. Filed Jan. 26, 1937. No. 2,128,987.

Motor fuels—Arthur L. Blount, Palos Verdes Estates, and Harold G. Reiber, Long Beach, Calif., assignors to Union Oil Co. (Calif.) Filed Sept. 27, 1935. Nos. 2,129,193 and 2,129,194.

Lubricating oils—Bert H. Lincoln and Gordon D. Byrkit, Ponca City, Okla., assignors to Continental Oil Co. Filed Mar. 23, 1936. No. 2,129,281.

Compound for lubricating wire rope—James F. Hall, Columbus, Ohio, assignor to Ironsides Co., same place. Filed Dec. 17, 1936. No. 2,129,422.

Founds Meter Fellowship At Mellon Institute

PITTSBURGH, Sept. 17.—Establishment of an industrial fellowship on meter technology at Mellon Institute by the Pittsburgh Equitable Meter Co. was announced by Dr. E. R. Weidlein, director. Dr. R. L. Wakeman, who has been with the institute since 1935, is to be the incumbent.

Col. W. R. Rockwell, president of Pittsburgh Equitable Meter Co., commenting upon the fellowship, said: "We have always maintained and will continue to maintain completely equipped and staffed chemical and physical laboratories which are constantly searching for better metering methods and materials. The scientific and technological problems involved in producing something better sometimes require intense research by scientists who can devote their entire time and energy to solution in a manner which cannot be expected from laboratories dealing with daily practical problems."

CORRECTION

CLEVELAND—A decrease of 9.18 per cent was erroneously shown for gasoline consumption in Tennessee for the first six months of this year, as compared with the first six months of last year, in a table of gasoline consumption figures by states published on page 17 of the Sept. 7 issue of N.P.N. This should have been an increase of 9.18 per cent for the first six months of 1938 in Tennessee.

Oil Man Heads Fund Drive

CHICAGO, Sept. 17.—Rawleigh Warner, vice-president and treasurer of the Pure Oil Co., will be sponsor division chairman for this year's Community Fund campaign in Chicago.

He will direct a sponsors' committee of 200 prominent Chicago citizens in soliciting special gifts, beginning Oct. 17. Mr. Warner has been active in Community Fund work for many years. The petroleum division, one of 60 industrial groups functioning during the campaign, last year contributed about $70,000. R. L. Milligan, The Pure Oil Co., was chairman of that division.

Winter Fuels

Berry's are prepared to furnish your requirements on modern fuel oils, range oils and furnace oils made with specifications to meet your particular needs.

We can ship promptly on short notice from conveniently situated refineries and terminals at prices we know will be competitive.

Your facilities, plus ours, gives you a setup equal to any.

We expect an increased demand for fuel oils this winter, due to the large additional installation of burners and would suggest you communicate with us at your earliest convenience.

JAMES B. BERRY SONS' CO., INC. OIL CITY, PA.

Branch Offices: **New York City; Chicago, Ill.; Boston, Mass.; Philadelphia, Pa.; Houston, Texas; London, England; Hamburg, Germany; The Hague, Holland.**

Refineries: **Oil City, Pa.; Emlenton, Pa.; Farmer's Valley, Pa.; St. Mary's, W. Va.**
Ocean Terminals: **Baltimore, Md.; Tiverton, R. I.; Dorchester, Mass.; Carteret, N. J.; Edgewater, N. J.; Glastonbury, Conn.; Philadelphia, Pa.**

Mines Bureau Revising Its Petroleum Films

N. P. N. News Bureau

WASHINGTON, Sept. 17.—"Evolution of the Oil Industry," one of Bureau of Mines' most popular educational films, is being revised, brought up to date, and will be available this fall and winter to class rooms, club and association meetings, and other groups of borrowers in its revised form, says the Bureau's motion picture division.

The film is one of 60 or more subjects circulated by the division, a dozen of which deal directly with the petroleum industry and all of which are available, gratis, to responsible borrowers.

Two other oil industry films are due for revision, "The Story of Gasoline" and "The Story of Lubricating Oil." Actual "shooting" on the new scenes to be made a part of these films, however, has not begun, as it has on the "Evolution" three-reeler.

Other oil films distributed by the Bureau include "Automobile Lubrication," "Petroleum, the Liquid Mineral," "Refining the Crude," "Story of a Mexican Gusher," "Through Oil Fields of Mexico," "Through Oil Lands of Europe and Africa—Germany, France, Spain, Morocco, Algeria," "Through Oil Lands of Europe and Africa—Italy, Hungary, the Danube, Rumania," "Through Oil Lands of Europe and Africa—Poland, Greece, Egypt."

The last named four, it is explained, are in reality travelogues with the oil angle predominantly played up.

"Co-operating Agencies"

All Bureau of Mines films are "sponsored," that is, produced in conjunction with a "co-operating agency"—an oil company, in the case of the oil films—which pays the cost of filming, although the Bureau does the actual filming, direction, and scenario writing, as well as handling all distribution.

The "Evolution" film now being revised, one of the most popular subjects on the Bureau's list, is in constant use, with the other oil films ranking near the top of the popularity list. Besides the strictly oil subjects, the automotive subjects on the Bureau's list go into use of internal combustion engine fuel, lubrication, and other petroleum uses.

"Co-operating agencies" for the various Bureau of Mines oil films now available include: St. Clair Refining Co., Standard Oil Co. of Indiana (two films), Pure Oil Co., American Oil Co.

Distribution of the Bureau's films is in charge of Louis F. Perry, supervising engineer, graphic section, at the Bureau of Mines Experiment Station, Pittsburgh. There is no rental charge for the films, the only cost to the borrower being transportation cost both ways, cost of all necessary telegrams, and of loss or damage. A catalogue of all films available may be obtained from Perry.

TRADEMARKS

The following are trademark applications pertinent to our field pending in the United States Patent Office which have been passed for publication and are in line for early registration unless opposition is filed promptly. For further information address National Trade-Mark Company, Munsey Building, Washington, D. C., trademark specialists.

As an additional service feature to its readers, this journal gladly offers to them an advance search free of charge on any mark they may contemplate adopting or registering. You may communicate with the Editor of this Department, or send your inquiry direct to the National Trade-Mark Company, stating that you are a reader of this journal.

Published Aug. 23, 1938

VELVOL. Ser. No. 406,134. Milton S. Hurwitz, Seattle, Wash. Filed May 9, 1938.

For lubricating oil.

HAPPY MOTORING. Ser. No. 406,784. Standard Oil Company of New Jersey, Wilmington, Del. Filed May 26, 1938.

For gasoline and lubricating oil.

FLARE, and design streak of lightning, etc. Ser. No. 408,085. The Bell Co., Inc., doing business as Flare Laboratories, Chicago, Ill. Filed July 1, 1938.

For knee action fluid, gasoline gauge fluid, fire extinguisher fluid, etc.

V. E. P. Ser. No. 405,565. The Ohio Oil Co., Findlay, O. Filed April 21, 1938.

For lubricating oils and greases.

* * *

Pub. Aug. 30, 1938

FILTREX, Ser. No. 405,814. The K & S Motor Products, Inc., Hillside, N. J. Filed Apr. 28, 1938.

For Filter Units for Gases or Oils and Similar Liquids Made of Spirally Wound Cellulose Sheets in Cloth Bags and/or Wool Discs Confined Between Perforated Discs.

MOUNTAIN POWER GASOLINE, picture of car climbing mountain, Ser. No. 401,333. J. Cohen & Son, Peoria, Ill. Filed Dec. 29, 1937.

For Gasoline.

ENERGIZER, Ser. No. 404,940. Gray Company, Incorporated, Minneapolis, Minn.

VITALIZER, Ser. No. 404,941. Gray Company, Incorporated, Minneapolis, Minn.

For Lubricating Equipment, Apparatus, and Machinery—Namely, Oil-Circulating and Filtering Apparatus for Flushing and Cleaning the Crank-Cases of Internal Combustion Engines and Any Other Similar Lubricant-Reservoirs of Engines, Automobiles and Other Machinery, and for Flushing and Cleaning the Bearings of Such Engines, Automobiles and Other Machinery Which May Normally be Supplied With Lubricant From Such Crank-Cases or Reservoirs and for Circulating in and out of Such Crank-Cases and Reservoirs the Lubricant Contents Thereof and Filtering and Cleaning Such Lubricant Contents; Manually as Well as Power-Operated Grease Guns, Oil Sprayers, Lubricant Dispensing Compressors, and Pumps.

* * *

Published Sept. 6, 1938

TRAILER-PACK. Ser. No. 391,746. Columbia Refining Co., Long Island, City, N. Y. Filed April 23, 1937.

For motor lubricating oils and greases.

CELLULUBE. Ser. No. 407,362. Celluloid Corporation, Newark, N. J. Filed June 11, 1938.

For chemical substance or mixture in liquid form (but which may be in solid, crystal or in any other form) used as a lubricant, etc.

"DUCHESS". Ser. No. 404,675. F. Marty & Co., Syracuse, N. Y. Filed March 30, 1938.

For hand dipped candles.

Ohio Oil Committee Looks At Record

YOUNGSTOWN, O.—Over 900,000 pieces of literature dealing with petroleum taxation and legislation were distributed by the Petroleum Industry Committee of Ohio during the year ended July, according to the sixth annual report of the committee prepared under the direction of Wendell Stephens, chairman of the executive committee. The committee fights excessive taxation, burdensome restrictions, gasoline tax diversion and other similar matters unfair to the industry.

One instance where the committee's work is being felt is in the drafting by the Lucas County Petroleum Industry Committee of an ordinance for Toledo governing installation and operation of filling stations and bulk plants and the handling of gasoline and other inflammable liquids.

Another instance is the state committee's objection to circularizing at filling stations a petition to license chain stores, including filling stations, ranging from $5 to $2500 per store, depending on number operated.

Changes during the year in personnel of the executive committee include G. R. Fenner, The Pure Oil Co., who succeeded R. D. McClaren of that company, as a member of this committee; and W. L. Hahn, Shell Petroleum Corp., who succeeded L. E. Hendricks, of the same company. L. H. Rogers, Rogers Oil Co., resigned upon his retirement when he sold his company to the Texas Distributing Co.

Markets

Mid-Continent

TULSA, Sept. 19.—Immediately after some jobbers had brought gasoline storage at their bulk plants up to seasonal working levels, a decided slump in orders—especially those for open market delivery—was reported by many Mid-Continent refiners. The buying slump and competitive conditions in the northern consuming area were factors in an 0.125-cent decline in gasoline prices, refiners said.

Unconfirmed reports of price shading on Texas Grade 26-70 natural gasoline were heard last week. Sellers, however, said they were still asking 3.25 cents. There were indications that 3.25 cents might be shaded on firm and large offers, but none of these offers had been made to "test" the market, traders said. Oklahoma natural market was in slightly better position, it was said.

Brokers last week reported offering Oklahoma 41-43 w.w. kerosine at prices 0.125 to 0.25 cent lower.

Pennsylvania

CLEVELAND, Sept. 19. — Little change was reported in the general market situation in western Pennsylvania the past week. Kerosine demand was only fair, and wax was easier, while demand for all other products continued fairly active, refiners said.

Minimum 65 octane gasoline was offered 0.25 cent lower at 6.75 cents by one upper field refiner; two others said they were still asking up to 7.25 cents. Fuel oil continued tight throughout the field. Upper field refiners reported 0.125 to 0.25-cent advances in their quotations.

Three refiners reported advancing their neutral oil quotations 0.5 to 1 cent a gallon. Their higher quotations, however, came within previously established price ranges. Neutral oils particularly remained tight, refiners said.

Mid-Western

CHICAGO, Sept. 19.—Quotations on low octane gasoline from some Chicago tank car marketers were reported 0.25 cent lower at 3.75 cents the past week. Other grades of gasoline also were offered 0.125 cent lower. Offerings of all grades in the open market were reported free. Contract movement was fairly active, according to most tank car marketers.

Both straight run and higher octane grades of Michigan gasoline were in good demand, refiners said. Freer offerings of straight run gasoline, however, were reported in some quarters at the close of the week.

Kerosine movement continued slow for the most part although a considerable amount was being shipped to northern Indiana, Chicago resale agents said. Michigan kerosine movement continued steady and inventories of this product were reported low by most refiners.

Gulf

NEW YORK, Sept. 19.—Attention of American suppliers was riveted on the European situation, where the antics of Hitler threaten to plunge the Continent into war.

The American Gulf, traders said, stands most to benefit from a war. They pointed out that supply condition in Roumania is tight, and participants would be dependent on an American supply of fuel oil and gasoline.

Meanwhile, gasoline continued to pile up at Gulf plants, according to reports of traders. Stocks figures of the American Petroleum Institute show an increase of nearly 1,000,000 barrels at Gulf coast plants since the middle of August.

Prices for gasoline, gas oil and fuel oils were easier, with especial easiness noted in gasoline, traders said.

Eastern

NEW YORK, Sept. 19.—Wholesale gasoline markets along the Atlantic Coast continued to feel the pressure of slow buying and heavy stocks, according to reports of buyers and sellers.

Slow buying was the result of decreased consumption, distributors said. Some of them estimated that gallonage, in the general eastern seaboard territory, is about 10% below a year ago. In the face of expected increases, this has thrown demand out of line with production, resulting in the inventory build-up, traders said.

While prices at eastern terminals did not change, according to reports last week, there were indications, and unconfirmed reports of buyers based on "market feelers," that firm offers to buy gasoline could shade current quotations by 0.25 to 0.375 cent in some markets.

N.P.N. Gasoline Index

	Dealer T.w. Cents per	Tank Car gal.
Sept. 19	10.06	5.88
Month ago	10.14	6.07
Year ago	10.70	6.72

Dealer index is an average of "undivided" dealer prices, ex-tax, in 50 cities.

Tank car index is a weighted average of 12 wholesale markets for regular-grade gasoline.

California

LOS ANGELES, Sept. 17. — Opening of bids by California refiners to supply some 270,000 barrels of Japanese Navy fuel oil over the next several months indicated continued weakness in the fuel oil market, although the price at which this business was reported awarded was somewhat higher than on previous bidding for the same quality product.

The Texas Co. was understood to have been awarded the business at a net price of 66.5 cents a barrel, about 2 cents a barrel higher than previously. Tide Water Associated was reported next in line with 68.5 cents, and from this price the bids ranged up to 90 cents a barrel.

This commodity is slightly better than Bunker C specifications, with a minimum gravity of 16 and a viscosity of 100 seconds at 77° F. (Furol).

Inquiry was also reported from the Far East for 10,000 to 50,000 tons of 24.9 maximum gravity diesel oil. Suppliers indicated prices would range in the neighborhood of 95 to $1.00 a barrel for this commodity. A cargo sold several weeks ago went at 93 cents.

A tendency toward slightly more firmness in the bulk fuel oil and gas oil market was reported; apparently on the reaction to possible European hostilities.

However, this improved feeling did not extend to domestic quotations on these products. A San Joaquin Valley independent refiner was said to be quoting diesel oil at 3 cents and several major suppliers were understood to be shading posted quotations to meet this condition.

Fuel Oil

TULSA, Sept. 19.—Supplies of Oklahoma No. 1 p.w. fuel oil were available to brokers at prices that permitted them to quote this product to jobbers at prices 0.125 to 0.25 cent lower, according to reports the past week. Nos. 2 and 3 oils were more closely held by most Mid-Continent refiners and prices were unchanged, it was said.

Inquiries for light fuels for heating purposes were more numerous although majority of jobber shipments were against contracts, refiners said.

Heavy oils were a problem at Mid-Continent plants, refiners said, as stocks continued to increase. It was believed by some observers that top-heavy fuel stocks might preclude any increase in refinery operations this fall.

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NEW YORK, Sept. 19.—Interest in fuel oils along the Atlantic seaboard increased somewhat as cooler weather blanketed the east. There were few changes of consequence, however, in refinery and terminals markets, accord-

(*Continued on page* 59)

REFINERY TANK CAR MARKETS

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days). Prices in cents per gallon except heavy fuel oils in dollars per barrel of 42 gallons, tank car lots, f.o.b. refineries in districts designated, except where otherwise noted. Inter-refinery and export prices not included, unless so stated in the respective markets. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude. Unless otherwise noted, gasoline octane ratings are determined by C.F.R. Motor method, A.S.T.M. D-357-337; and lubricating oil specifications determined according to A.S.T.M. methods, unless otherwise noted.

Gasoline

Prices Effective	Sept. 19	Sept. 12
OKLAHOMA		
U. S. Motor: (Octane L-3)		
62 oct. & below	4.125– 5.00	4.50 – 5.00
63-66 oct.	4.50 – 5.125	4.75 – 5.125
67-69 oct.	4.75 – 5 375	5.00 – 5.375
70-72 oct.	5.125– 5.75	5.25 – 5.75
60-62, 400 e.p.	4.375– 4.50	4.50 – 4.625
WESTERN PENNA.		
Bradford-Warren:		
Motor gasoline:		
U. S. Motor (58-62°)	5.25	5.25
Min. 65 oct.	6.75 – 7.25	7.00 – 7.25
Min. 70 oct.	(e)7.50	(e)7.50
"Q" gasoline	(e&g)7.25	(e & g)7.25
Other districts:		
Motor gasoline:		
U. S. Motor (58-62°)	5.00	5.00
Min. 65 oct.	6.50 – 6.75	(h) 6.50 –7.00
"Q" gasoline	(g) 7.00 –7.25	(g) 7.00 –7.25
CENTRAL MICHIGAN (a)		
Str.-Run Gasoline	(c) 5.00 –5.375	(c) 5.00 –5.375
U. S. Motor: (Octane L-3)		
67-69 octane	(e)7.50	(e)7.50
70-72 octane	8.00 – 8.125	8.00 – 8.125
CALIFORNIA (3c tax to be added if used in state)		
U. S. Motor:		
54-58, for instate shipment	6.75 – 9.25	6.75 – 9.25
54-58, for outside state shipment	7.00 – 9.00	7.00 – 9.00
58-61, 375-400 e.p., 65 oct. & above	7.75 – 9.75	7.75 – 9.75
N. TEX. (b)		
U. S. Motor: (Octane L-3)		
62 oct. & below	4.50 – 4.75	4.50 – 5.00
63-66 oct.	4.75 – 5.25	4.75 – 5.50
67-69 oct.	5.00 – 5.375	5.00 – 5.50
70-72 oct.	5.375– 5.625	5.375– 5.625
60-62, 400 e.p.	4.50	4.50 – 4.625
KANSAS (For Kansas destinations only)		
U. S. Motor: (Octane L-3)		
62 oct. & below	4.625– 5.00	4.625– 5.125
70-72 oct.	5.50 – 5.75	5.50 – 5.875
W. TEX. (b)		
U. S. Motor: (Octane L-3)		
62 oct. & below	4.50 – 4.75	4.625– 4.75
63-66 oct.	4.75 – 5 125	4.875– 5.125
67-69 oct.	5.125– 5.375	5.25 – 5.375
70-72 oct.	5.375– 5.75	5.50 – 5.75
E. TEX.		
60-62, 400 e.p.	4.50 – 4.625	4.50 – 4.625
N. LA. (For shipment to La. & Ark.)		
U. S. Motor: (Octane L-3)		
62 oct. & below	4.50 – 4.75	4.625– 4.75
63-66 oct.	(e)4.875	(e)5.00
67-69 oct.	(e)5.00	(e)5.125
70-72 oct.	5.50	5.625– 5.75
ARKANSAS (F.o.b. Ark. plant of one refiner, for shipment to Ark. & La.)		
U. S. Motor: (Octane L-3)		
62 octane & below	4.75	4.875
67-69 oct.	5.50	5.50
OHIO (Quotations of S. O. Ohio. Delivered anywhere in Ohio).		
U. S. Motor	7.875	8.00
Above 65 oct.	8.125	8.25

Natural Gasoline

(Prices to blenders on freight basis shown below. Shipments may originate in any Mid-Continent manufacturing district.)

F.O.B. GROUP 3		
Grade 26-70	3.25	3.25
F.O.B. BRECKENRIDGE		
Grade 26-70	2.75 – 3.25	3.25
CALIFORNIA (F.o.b. plants in Los Angeles basin)		
75-85, 350-375 e.p. for blending	6.50 – 7.00	6.75 – 7.00

Kerosine

Prices Effective	Sept. 19	Sept. 12
WESTERN PENNA.		
Bradford-Warren:		
45 w.w.	5.125– 5.375	5.125– 5.375
46 w.w.	(e) 5.25 –5.375	(e) 5.25 –5.375
Other districts:		
45 w.w.	4.875– 5.00	4.875– 5.00
46 w.w.	(h)5.125	(h)5.125
47 w.w.	5.125– 5.25	5.125– 5.25
CENTRAL MICHIGAN (a)		
47-49 w.w.	5.05 – 5.30	5.00 – 5.30
OKLAHOMA		
41-43 w.w.	3.75 – 4.25	4.00 – 4.25
42-44 w.w.	4.25 – 4.625	4.25 – 4.625
KANSAS (For Kansas destinations only).		
41-43 w.w.	4.375– 4.625	4.625
42-44 w.w.	4.625– 5.00	4.625– 5.00
N. TEX. (b)		
41-43 w.w.	4.25 – 4.50	4.25 – 4.50
N. LA. (For shipment to La. and Ark.)		
41-43 w.w.	4.00 – 4.50	4.00 – 4.50
ARK. (F.o.b. Ark. plant of one refiner, for shipment to Ark. and La.)		
41-43 w.w.	4.625	4.625
CALIFORNIA		
40-43 w.w.	5.00 – 7.00	5.00 – 7.00

Gas *and* Fuel Oils

WESTERN PENNA.		
Bradford-Warren:		
36-40	4.375– 4.50	4.375– 4.50
Other districts: (Excluding Pittsburgh District Prices).		
36-40	4.00	4.00
CENTRAL MICHIGAN (a)		
P.W. Distillate	4.75 – 5.00	4.75 – 4.875
No. 3 gas oil, Str.	4.25 – 4.75	4.25 – 4.75
U.G.I. gas oil	4.00 – 4.375	4.00 – 4.375
Fuel Oils (Vis. at 100):		
500-700 Vis.	2.375– 2.50	2.375– 2.50
300-500 Vis.	2.50 – 2.75	2.50 – 2.75
100-300 Vis.	2.625– 3.25	2.625– 3.25
OKLAHOMA		
No. 1 prime white	3.50 – 4.00	3.75 – 4.00
No. 2 straw	3.50 – 3.75	3.50 – 3.75
U. G. I. gas oil	(f)	(e)3.25
28-30 fuel oil	(e)3.25	....
28-30 zero fuel	3.25 – 3.50	3.25 – 3.50
24-26 fuel	(e)$0.925	(e)$0.925
18-22 fuel	(f)	(f)
14-16 fuel	(e)$0.70	(e)$0.70
KANSAS (For Kans. destinations only).		
No. 1 p.w. fuel oil	4.00 – 4.125	4.125
10-14 fuel oil	$0.45 –$0.80	$0.45 –$0.80
N. TEX. (b)		
No. 1 Prime white	(e)4.00	(e)4.00
N. LA. (For shipment to La. and Ark.)		
20-24 fuel	(e) $1.05–$1.10	(e) $1.05–$1.10
16-20 fuel	(e) $0.85–$0.90	(e) $0.85–$0.90
10-14 fuel	(e) $0.75–$0.80	(e) $0.75–$0.80
ARK. (F.o.b. Ark. plant ot one refiner, for shipment to Ark. and La.)		
No. 2 fuel	3.625	3.625
28-30 gas oil, zero	3.375	3.375
CALIFORNIA		
San Joaquin Valley:		
Heavy fuel	$0.55 –$0.75	$0.55 –$0.75
Light fuel	$0.70 –$0.85	$0.70 –$0.85
Diesel fuel (per gal.)	3.00 – 4.00	3.50 – 4.00
Stove dist. (per gal.)	3.75 – 6.00	3.75 – 6.00
Los Angeles:		
Heavy fuel	$0.45 –$0.90	$0.45 –$0.90
Light fuel	$0.60 –$1.00	$0.60 –$1.00
Diesel fuel (per gal.)	2.50 – 4.00	2.50 – 4.00
Stove dist. (per gal.)	2.75 – 6.00	2.75 – 6.00
San Francisco:		
Heavy fuel	$0.95	$0.95
Light fuel	$1.05	$1.05
Diesel fuel (per gal.)	4.50	4.50
Stove dist. (per gal.)	6.50	6.50

Note: All above heavy fuels meet Pacific specification 400; light fuel, spec. 300; Diesel fuels, spec. 200; and stove distillate, spec. 100.

Neutral Oils

Prices Effective	Sept. 19	Sept. 12
WESTERN PENNA. (Refiners report no open spot market sales being made to jobbers and give following as their quotations only.)		
Viscous Neutrals No. 3 col. (*Viscosity at 70° F.*)		
200 Vis. (180 at 100°) 420-425 fl.		
0 p.t.	18.00 –19.50	18.00 –19.50
10 p.t.	17.00 –18.50	17.00 –18.50
15 p.t.	16.50 –18.00	16.50 –18.00
25 p.t.	15.00 –16.00	15.00 –16.00
150 Vis. (143 at 100) 400-405 fl.		
0 p.t.	17.00 –17.50	17.00 –17.50
10 p.t.	16.00 –16.50	16.00 –16.50
15 p.t.	15.00 –15.50	15.00 –15.50
25 p.t.	14.00 –15.00	14.00 –14.50
SOUTH TEXAS		
Vis. Color		
Pale Oils: (*Vis. at 100°F.*)		
100 No. 1½-2½	4.75 – 5.25	4.75 – 5.25
200 No. 2-3	6.25	6.25
300 No. 2-3	6.75	6.75
500 No. 2½-3½	7.75	7.75
750 No. 3-4	8.25	8.25
1200 No. 3-4	8.75	8.75
2000 No. 4	9.00 – 9.25	9.00 – 9.25
Red Oils:		
200 No. 5-6	6.25	6.25
300 No. 5-6	6.75	6.75
500 No. 5-6	7.75	7.75
750 No. 5-6	8.25	8.25
1200 No. 5-6	8.75	8.75
2000 No. 5-6	9.00 – 9.25	9.00 – 9.25

Note: Red oil prices cover oils with green cast; blue cast red oils are slightly lower in some cases.

MID-CONTINENT (Vis. at 100° F.; F.o.b. Tulsa basis).

Pale Oils: (0 to 10 P.P.) Vis. Color		
60-85—No. 2	5.50	5.50
86-110—No. 2	6.00	6.00
150—No. 3	9.00	9.00
180—No. 3	10.00	10.00
200—No. 3	10.50	10.50
250—No. 3	11.50	11.50
280—No. 3	12.50	12.50
300—No. 3	13.00	13.00
Red Oils:		
180—No. 5	(e)9.00	(e)9.00
200—No. 5	9.50 –10.00	9.50 –10.00
280—No. 5	11.50 –11.75	11.50 –11.75
300—No. 5	(e)11.75	(e)11.75

Note: The following oils, of 15 to 25 p.p., are generally quoted these amounts under 0-10 p.p.; viscous oils, 0.5c; non-viscous, 0.25c. Viscous oils (150-300 vis.), No. 4 color, generally are quoted 0.5c above No. 5 color oils.

CHICAGO (Vis. at 100° F.)

Pale Oils 0 to 10 p.p.: Vis. Color		
60-85—No. 2	7.25	7.25
86-110—No. 2	7.75	7.75
150—No. 3	10.00	10.00
180—No. 3	11.00	11.00
200—No. 3	11.50	11.50
250—No. 3	12.50	12.50
Red Oils:		
180—No. 5	10.00	10.00
200—No. 5	10.50	10.50
250—No. 5	11.50	11.50
280—No. 5	12.50	12.50
300—No. 5	12.75	12.75

Note: Viscous oils, 15 to 30 p.p. are quoted 0.5c lower; 60-85 and 86-110 No. 2 non-viscous oils, 15 to 30 p.p., 0.25c lower. To obtain delivered prices in Chicago, add 0.25c per gal.

Cylinder Stocks

MID-CONTINENT (F.o.b. Tulsa basis)

Bright Stocks:		
190-200 Vis. at 210 °D.	(e)19.00	(e)19.00
150-160 Vis. at 210°D:		
0 to 10 p.p.	14.25 –16.00	14.25 –16.00
10 to 25 p.p.	13.50 –15.50	13.50 –15.50
25 to 40 p.p.	13.50 –15.00	13.50 –15.00
150-160 vis. at 210° E.	12.50 –15.00	12.50 –15.00

(a) Prices f.o.b. Central Michigan refinery group basis, for shipment within Mich. Shipments may originate at plants outside Central group. (b) For shipment to Texas and New Mexico destinations; Group 3 prices quoted on northern shipments. (c) Excluding Detroit shipment. (d) Nominal. (e) One refiner quoting. (f) No price reported. (g) To resellers holding licenses. (h) Two refiners quoting.

MARATHON LUBRICANTS

RADIATION OF QUALITY

Quality in petroleum products is essential to the rapid and successful building of an oil jobbing business. This year the demand for MARATHON LUBRICANTS has reached a new high, offering aggressive distributors who are looking for a fast moving quality product an unequaled opportunity for volume sales and profits.

Give your customers the extra protection of the world's finest lubricants at no extra cost and watch your sales volume and profits climb. Take advantage of the exclusive territory franchise offered by The Ohio Oil Company.

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THE OHIO OIL COMPANY

GENERAL OFFICES - - - - FINDLAY, OHIO

ROBINSON, ILLINOIS TULSA, OKLAHOMA FT. WORTH, TEXAS

REFINERY TANK CAR MARKETS

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days) unless otherwise stated. Prices in cents per gallon, except heavy fuel oils in dollars per barrel of 42 gallons, wax and petrolatums in cents per pound in barrels, tank car lots, f.o.b. refineries in districts designated, except where otherwise noted. Inter-refinery and export prices not included unless so stated in the respective markets. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude. Unless otherwise noted, gasoline octane ratings are determined by C.F.R. Motor method, A.S.T.M. D-357-33T; and lubricating oil specifications determined according to A.S.T.M. methods, unless otherwise noted.

Cylinder Stocks (cont'd)

Prices Effective	Sept. 19	Sept. 12
Mid-Continent (cont'd)		
120 Vis. at 210° D		
0 to 10 p.p.	14.50 –15.125	14.50 –15.125
25 to 40 p.p.	(b)14.25	(e)14.25
600 S.R. Dark Green	(b)5.00 – 7.50	5.00 – 7.50
600 S.R. Olive Green	6.50 – 7.50	6.50 – 7.50
631 S.R.	(b)12.50	(e)12.50
Black Oil	3.50 – 4.00	3.50 – 4.00
CHICAGO (Viscosity at 210°)		
Unfiltered Steam Refined:		
140	9.00	9.00
160	10.00	10.00
200	11.00	11.00
Bright stocks, 160 vis. at 210. No. 8 color:		
0 to 10 p.p.	15.75	15.75
15 to 25 p.p.	14.75	14.75
30 to 40 p.p.	14.25	14.25
E filtered Cyl. Stock	13.50	13.50

Note: To obtain prices delivered in Chicago, add 0.25c per gal.

Prices Effective	Sept. 19	Sept. 12
WESTERN PENNA. (Refiners report no open spot market sales being made to jobbers and give following as their quotations only.)		
600 S.R. filterable	8.00 – 8.50	8.00 – 8.50
650 S.R.	10.00 –11.50	10.00 –11.50
600 fl.	10.50 –12.50	10.50 –12.50
630 fl.	13.00 –14.00	13.00 –14.00
Bright stock, 145-155 vis. at 210°, 540-550 flash, No. 8 color:		
10 p.t.	17.00	17.00
15 p.t.	16.00	16.00
25 p.t.	14.00 –14.50	14.00 –14.50

Petrolatums

WESTERN PENNA. (In bbls., carloads; in tank cars, 0.5c less)		
Snow White	6.125	6.125
Lily White	5.125	5.125
Cream White	4.125	4.125
Light Amber	2.50 – 2.625	2.50 – 2.625
Amber	2.25 – 2.375	2.25 – 2.375
Red	2.00	2.00

Wax

Prices Effective	Sept. 19	Sept. 12
WESTERN PENNA. (Refiners report no open spot market sales being made to jobbers and give following as their quotations only. In bbls., carloads, New York)		
122-124 A.m.p., w.c. scale	(e)2.40	(e)2.40
124-126 A.m.p., w.c. scale	2.35 – 2.40	2.35 – 2.45
133-135 A.m.p., w.c. scale	....	(b)3.625
OKLAHOMA (In bbls. or burlap bags, carloads)		
124-126 A.m.p., w.c. scale	2.35	2.35
CHICAGO (In bags, carload lots. Melting points are E.M.P. (A.S.T.M.) methods; add 3° F. to convert into A.m.p.)		
Fully refined:		
122-124	4.00	4.00
125-127	(d)4.10	(d)4.10
127-129	(d)4.45	(d)4.45
130-132	(d)4.75	(d)4.75
132-134	(d)5.00	(d)5.00
135-137	(d)5.75	(d)5.75

(a) Nominal. (b) Only one refiner quoting. (c) No price reported. (d) Same prices quoted in bags or slabs loose. (e) Two refiners quoting.

MID-WESTERN TANK CAR MARKET

(Prices group 3 basis; origin of shipments unknown)

Gasoline

Prices Effective	Sept. 19	Sept. 12
U. S. Motor: (Octane L-3)		
62 oct. and below	3.75 – 4.625	4.00 – 4.75
63-66 oct.	4.25 – 4.875	4.375– 4.875
67-69 oct.	4.375– 5.125	4.625– 5.25
70-72 oct.	4.625– 5.25	4.75 – 5.375

Kerosine

41-43 w.w.	3.625– 4.25	3.625– 4.25
42-44 w.w.	3.625– 4.375	3.625– 4.375

(a) Nominal.

Fuel and Gas Oils

Prices Effective	Sept. 19	Sept. 12
No. 1 p.w.	3.625– 3.875	3.625– 3.875
No. 1 straw	3.50 – 3.75	3.50 – 3.75
No. 2 straw	3.50 – 3.625	3.50 – 3.625
No. 3	3.25 – 3.375	3.25 – 3.375
No. 5	(a) $0.60-$0.725	(a) $0.60–$0.70
No. 6	(a) $0.35–$0.50	(a) $0.35–$0.50
U. G. I. gas oil	(a) 2.875–3.125	(a) 2.875–3.125
Range oil	3.625– 4.00	3.625– 4.00

Naphtha and Solvent

Stoddard solvent	5.875	5.875
Cleaners' naphtha	6.375	6.375
V. M. & P. naphtha	6.375	6.375
Mineral spirits	5.375	5.375
Rubber solvent	6.375	6.375
Lacquer diluent	7.375	7.375

DAILY GASOLINE PRICES

Daily range of gasoline prices as reported in PLATT'S OILGRAM (Week Ended Sept. 16, 1938)

	Sept. 12	Sept. 13	Sept. 14	Sept. 15	Sept. 16
U. S. Motor, (Octane Number determined according to L-3 Method in Okla., Texas and Mid-Western Districts):					
62 octane and below:					
Oklahoma	4.50 – 5.00	4.375– 5.00	4.375– 5.00	4.375– 5.00	4.375– 5.00
(b) North Texas	4.50 – 5.00	4.50 – 5.00	4.50 – 5.00	4.50 – 5.00	4.50 – 5.00
West Texas	4.625– 4.75	4.625– 4.75	4.625– 4.75	4.50 – 4.75	4.50 – 4.75
Mid-Western (Group 3 basis)	4.00 – 4.75	4.00 – 4.75	4.00 – 4.75	3.75 – 4.625	3.75 – 4.625
63-66 octane:					
Oklahoma	4.75 – 5.125	4.625– 5.125	4.625– 5.125	4.625– 5.125	4.625– 5.125
(b)North Texas	4.75 – 5.50	4.75 – 5.50	4.75 – 5.50	4.75 – 5.50	4.75 – 5.50
West Texas	4.875– 5.125	4.875– 5.125	4.875– 5.125	4.75 – 5.125	4.75 – 5.125
Mid-Western (Group 3 basis)	4.375– 4.875	4.375– 4.875	4.375– 4.875	4.375– 4.875	4.25 – 4.875
67-69 octane:					
Oklahoma	5.00 – 5.375	4.875– 5.25	4.875– 5.375	4.875– 5.375	4.875– 5.375
(b)North Texas	5.00 – 5.50	5.00 – 5.50	5.00 – 5.50	5.00 – 5.50	5.00 – 5.50
West Texas	5.25 – 5.375	5.25 – 5.375	5.25 – 5.375	5.125– 5.375	5.125– 5.375
Mid-Western (Group 3 basis)	4.625– 5.25	4.50 – 5.25	4.50 – 5.25	4.50 – 5.125	4.50 – 5.125
70-72 octane:					
Oklahoma	5.25 – 5.75	5.125– 5.75	5.125– 5.75	5.125– 5.75	5.125– 5.75
(b)North Texas	5.375– 5.625	5.375– 5.625	5.375– 5.625	5.375– 5.625	5.375– 5.625
West Texas	5.50 – 5.75	5.50 – 5.75	5.50 – 5.75	5.375– 5.75	5.375– 5.75
Mid-Western (Group 3 basis)	4.75 – 5.375	4.625– 5.375	4.625– 5.375	4.625– 5.375	4.625– 5.25
Motor Gasoline, 60-64 octane:					
New York harbor	(a) 6.25– 6.75	(a) 6.25 –6.75	(a) 6.25 –6.75	(a) 6.25 –6.75	(a) 6.25– 6.75
Philadelphia district	(a) 6.00– 6.50	(a) 6.00 –6.50	(a) 6.00 –6.50	(a) 6.00 –6.50	(a) 6.00 –6.50
Baltimore district	(a) 6.25– 6.50	(a) 6.25 –6.50	(a) 6.25 –6.50	(a) 6.25 –6.50	(a) 6.25– 6.50
Motor Gasoline, 65 octane & above:					
New York harbor	(a) 6.25– 6.75	(a) 6.25 –6.75	(a) 6.25 –6.75	(a) 6.25 –6.75	(a) 6.25 –6.75
Philadelphia district	(a) 6.00 –6.50	(a) 6.00 –6.50	(a) 6.00 –6.50	(a) 6.00 –6.50	(a) 6.00 –6.50
Baltimore district	(a) 6.50 –6.75	(a) 6.50 –6.75	(a) 6.50 –6.75	(a) 6.50 –6.75	(a) 6.50 –6.75
U. S. Motor, 58-62°:					
Bradford-Warren (Western Penna.)	5.25	5.25	5.25	5.25	5.25
Other districts (Western Penna.)	5.00	5.00	5.00	5.00	5.00
Motor Gasoline, Min. 65 octane:					
Bradford-Warren (Western Penna.)	7.00 – 7.25	7.00 – 7.25	6.75 – 7.25	6.75 – 7.25	6.75 – 7.25
Other districts (Western Penna.)	(e) 6.50 –7.00	(e) 6.75 –7.00	6.50 – 6.75	6.50 – 6.75	6.50 – 6.75
Motor Gasoline, Min. 70 octane:					
Bradford-Warren (Western Penna.)	(c)7.50	(c)7.50	(c)7.50	(c)7.50	(c)7.50
"Q" Gasoline:					
Bradford-Warren (Western Penna.)	(c&d)7.25	(c&d)7.25	(c&d)7.25	(c&d)7.25	(c&d)7.25
Other Districts (Western Penna.)	(d) 7.00 –7.25	(d) 7.00 –7.25	(d) 7.00 –7.25	(d) 7.00 –7.25	(d) 7.00 –7.25

(a) Nominal. (b) For shipment to Texas and New Mexico destinations; Group 3 prices are quoted on northern shipment.
(c) One refiner quoting. (d) To resellers holding licenses. (e) Two refiners quoting.

TANK WAGON MARKETS

Tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes;** *they do, however, include inspection fees as shown in general footnote. Gasoline taxes, shown in separate column, include 1c federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes, where levied, are indicated in footnotes. Discounts to various classes of buyers also are shown in footnotes. These prices in effect Sept. 19, 1938, as posted by principal marketing companies at their headquarters offices, but subject to later correction.*

S. O. New Jersey

Essolene
(Regular Grade)

	Consumer Tank Car	Dealer T.W.	Gasoline Taxes	Kerosine T.W.
*Atlantic City, N. J.	7.4	9.4	4	8
*Newark, N. J.	7.4	9.4	4	8
Annapolis, Md.	8.35	9.85	5	9.5
Baltimore, Md.	7.75	9.25	5	9
Cumberland, Md.	9.15	11.65	5	10
Washington, D. C.	8	9.5	3	9.5
Danville, Va.	8.45	10.95	6	12.9
Norfolk, Va.	7.25	9.75	6	11.5
Petersburg, Va.	7.55	10.05	6	11.7
Richmond, Va.	7.55	10.05	6	11.7
Roanoke, Va.	8.75	11.25	6	12.9
Charleston, W. Va.	8.55	11.05	6	12.6
Parkersburg, W. Va.	7.85	9.35	6	11.2
Wheeling, W. Va.	8.85	10.25	6	12.2
Charlotte, N. C.	9.15	11.65	7	12.1
Hickory, N. C.	9.65	12.15	7	12.5
Mt. Airy, N. C.	9.45	11.95	7	12.3
Raleigh, N. C.	8.75	11.25	7	11.6
Salisbury, N. C.	9.25	11.75	7	12.2
Charleston, S. C.	7.75	10.25	7	10.6
Columbia, S. C.	8.75	11.25	7	11.6
Spartanburg, S. C.	9.45	11.95	7	12.4

Discount to undivided dealers: Dealer t.w. price less 0.5c per gal.

*Effective June 21, 1938, S. O. New Jersey posted a minimum retail resale price of 11.9c at these two points.

Note: While the above posted prices continue in New Jersey, dealers will pay a net price of 8.9c per gal. for Essolene. Dealers having pumps marked only Esso, Essolene and "Standard" White gasoline will pay 8.4c per gal. for Essolene.

Price basis to commercial consumers: To contract accounts, purchasing at least one full compartment at a time by hose connection: Effective March 12, 1937, in New Jersey, and March 8 in Maryland, District of Columbia, and in Arlington and Fairfax Counties in Virginia, on yearly purchases: from 2,500 to 100,000 gals., consumer t.w. price at time and place of delivery; 100,000 gals. per year consumer tank car price, plus 0.5c per gal. Generally consumer t.w. price in foregoing states is equivalent of dealer t.w. price, less 0.5c per gal.

Effective May 15, 1937, on Essolene and Esso (by tank wagon) in North and South Carolina, West Virginia and Virginia (except Arlington and Fairfax Counties, which see above), commercial consumers taking deliveries of 50 gals. (West Va. 100 gals.) or more at one time will be billed at the posted consumer t.w. price. Deliveries less than 50 gals. (West Va. 100 gals.) will be billed at 4c per gal. over posted consumer t.w. price. Generally, posted consumer t.w. price will be equivalent to the dealer price less 0.5c per gal.

Kerosine Discount: 1c off t.w. price for 25 gals., or more, under contract thru territory (Baltimore City contract not necessary) except no discount in state of New Jersey.

Socony-Vacuum Oil Co., Inc.

(S. O. New York Division)

Socony Mobilgas
(Regular Grade)

	Consumer Tank Car	"Split" Dealer T.W.	Gasoline Taxes	Kerosine T.W.
Metropolitan N. Y. City:				
Boroughs of Manhattan, Bronx and Brooklyn (Kings and Queens)	7.25	8.9	*5	8
Borough of Richmond (Staten Is.)	7.25	8.9	*5	8
Albany, N. Y.	7.3	9.3	5	8.5
Binghamton, N. Y.	8.5	10	5	9
Buffalo, N. Y.	8.1	9.1	5	8
Jamestown, N. Y.	7.8	9.8	5	8.25
Plattsburg, N. Y.	7.8	9.8	5	9.5
Rochester, N. Y.	8.2	10	5	8.5
Syracuse, N. Y.	7.9	9.5	5	9
Danbury, Conn.	7.6	9.6	4	9
Hartford, Conn.	7.4	9	4	7
New Haven, Conn.	7.3	9.3	4	7
Bangor, Me.	7.75	9.5	5	9
Portland, Me.	7.25	9	5	8.75
Boston, Mass.	7	8.5	4	8
Concord, N. H.	8.1	9.9	5	9
Lancaster, N. H.	9	11.2	5	10.25
Manchester, N. H.	7.8	9.5	5	8.5
Providence, R. I.	7	8.5	4	7.5
Burlington, Vt.	7.65	9.7	5	9.5
Rutland, Vt.	8	10	5	9

*Plus 2% city sales tax computed at time of each sale.

Discount to undivided dealers: 0.5c less than "split" dealer t.w.

Price basis to commercial consumers: Effective about Nov. 15, 1936 in New York and New England for tank wagon delivery: monthly purchases of 25,000 gals. or over, pay consumer tank car price at point of delivery, plus 0.5c gal.; monthly purchases of 5,000 to 25,000 gals., pay undivided dealer tank wagon price at point of delivery; monthly purchases of less than 5,000 gals., pay divided dealer tank wagon price at point of delivery. Private consumers pay undivided dealer tank wagon price at point of delivery, plus 2c gal.

Atlantic Refining

Atlantic White Flash Gasoline
(Regular Grade)

	Commercial Tank Car	Dealer T.W.	Gasoline Taxes	Kerosine T.W.
Philadelphia, Pa.	6.5	7	5	10
Pittsburgh	8	10	5	10.5
Allentown	7.5	9	5	10.5
Erie	8	9.5	5	10
Scranton	7.5	9	5	10.5
Altoona	8	10	5	10.5
Harrisburg	7.5	9	5	10.5
Williamsport	7.5	9	5	10.5
Dover, Del.	...	7.5	5	10.5
Wilmington	...	8.5	5	9.75
Boston, Mass.	...	8.5	4	8
Springfield, Mass.	...	9	4	8
Worcester, Mass.	...	9	4	8
Fall River, Mass.	...	8.5	4	8
Hartford, Conn.	...	9	4	7
New Haven, Conn.	...	9.3	4	7
Providence, R. I.	...	8.5	4	8
Atlantic City, N. J.	...	8.9	4	8
Camden, N. J.	...	8.9	4	8
Trenton, N. J.	...	8.4	4	8
Annapolis, Md.	...	9.85	5	9.5
Baltimore, Md.	...	9.25	5	9
Hagerstown, Md.	...	10.35	5	10
Richmond, Va.	...	10.05	6	11.7
Wilmington, N. C.	...	10.35	7	10.8
Brunswick, Ga.	...	10	7	*11.5
Jacksonville, Fla.	...	7	8	10

*Georgia has kerosine tax of 1c per gal., not included in above price.

Discount to undivided dealers: Dealer t.w. less 0.5c per gal. except in Georgia and Florida, dealer t.w. and undivided dealer price is same.

Price basis to commercial consumers: consumers under contract, in Penna. and Delaware, effective Mar. 11, 1937, on yearly gasoline purchases taking full compartment hose deliveries, using 100,000 gals. or more per year, tank car price plus 0.5c per gal.; consumers taking less than 100,000 gals., undivided dealer price. Consumers under contract and not under contract, taking less than full compartment delivery, and consumers not under contract taking full compartment delivery, get divided dealer price. Consumers taking less than 25 gals., t.w. delivery, get 4c above undivided dealer price.

Discount on kerosine: Effective Oct. 29, 1936, in Pennsylvania and Delaware, 2c per gal. off t.w. price on t.w. deliveries of 25 gals. or more at one time.

S. O. Ohio

Sohio X-70 Gasoline
Regular Grade)

	Consumer T.W.	†Divided Dlr.	Gasoline Taxes	Kerosine T.W.
Ohio State-wide	11.5	10.5	5	*12
Counties where prices are below statewide:				
Butler, Clark, Clinton, Columbiana, Defiance, Greene, Knox, Montgomery, Pickaway and Preble:	11	10	5	....
Hamilton	11	9.5	5	....
Franklin and Paulding:	10.5	9.5	5	....

Renown Gasoline
(Third Grade)

Ohio State-wide	11	10	5	....
Counties where prices are below statewide:				
Hamilton	11	9.5	5	....
Clark, Columbiana, Defiance, Knox and Pickaway	10.5	9.5	5	....
Franklin and Paulding:	10	9	5	....
Counties where prices are above statewide:				
Clermont, Darke, Miami and Warren:	11.5	10.5	5	....

S. O. Ohio Cont'd

Kerosine Prices

(Off Statewide Level)

Kerosine prices are off statewide level in the following counties:

Allen, Auglaize, Champaign, Columbiana, Darke, Geauga, Greene, Hardin, Logan, Mahoning, Mercer, Preble, Putnam, Shelby, Trumbull and Van Wert	*11.5
Paulding	*11
Ashtabula	*10.5
Fayette, Madison, Pickaway, Portage and Summit	*8.5

†This price also to authorized agents, exclusive of 0.5c rental. Discount to undivided dealers: 0.5c less than divided dealer t.w.

*Ohio has kerosine tax of 1c per gal., not included in above prices.

Commercial Tank Wagon Q.D.A. to contract accounts: Effective Oct. 20, 1937, thru Ohio (except in 30 counties), on monthly purchases, off posted consumer t.w. price: 0 to 999 gals., 0.5c; 1,000 to 19,999 gals., 1.5c; 20,000 gals. and over, 2.5c. The 30 counties where Q.D.A. differs from statewide are: Allen, Ashtabula, Auglaize, Butler, Champaign, Cuyahoga, Darke, Defiance, Erie, Fulton, Geauga, Hamilton, Hancock, Hardin, Henry, Highland, Logan, Lorain, Lucas, Mahoning, Mercer, Ottawa, Paulding, Putnam, Sandusky, Scioto, Shelby, Trumbull, Van Wert, Washington, Williams and Wood.

Sales tax: Ohio's 3% sales tax, effective Jan. 27, 1935, is added "where assessable, to regular posted prices," S. O. Ohio says.

On kerosine, prices to resellers and commercial consumers are posted generally at 3c per gal. below consumer t.w. price in any quantity, when such prices are on statewide level.

S. O. Kentucky

Crown Gasoline
(Regular Grade)

	Consumer T.W.	Net Dlr.	Gasoline Taxes	Kerosine T.W.
Covington, Ky.	12	9	6	10.5
Lexington, Ky.	13.5	10.5	6	10.5
Louisville, Ky.	13	10	6	10
Paducah, Ky.	10.5	7.5	6	10
Jackson, Miss.	12.5	9.5	7	*9.5
Vicksburg, Miss.	13	10	7	*9
Birmingham, Ala.	13.5	10.5	*8	10
Mobile, Ala.	12.5	9.5	*9	9
Montgomery, Ala.	12.5	10.5	*9	*9
Atlanta, Ga.	12	9	7	*9
Augusta, Ga.	12.5	9.5	7	*7
Macon, Ga.	12.5	9.5	7	*10.5
Savannah, Ga.	12	9	7	*9
Jacksonville, Fla.	10	7	8	8
Miami, Fla.	12.5	9.5	8	9
Pensacola, Fla.	12	9	*9	10
Tampa, Fla.	10	7	8	8.5

Kyso Gasoline
(Third Grade)

Covington, Ky.	10.5	8	6	....
Lexington, Ky.	12	9.5	6	....
Louisville, Ky.	11.5	9	6	....
Paducah, Ky.	9.5	7	6	....
Jackson, Miss.	10.5	8	7	....
Vicksburg, Miss.	10.5	8	7	....
Birmingham, Ala.	11.5	9	*8	....
Mobile, Ala.	10.5	8	*9	....
Montgomery, Ala.	11.5	9	*9	....
Atlanta, Ga.	8.5	6	7	....
Augusta, Ga.	11	8.5	7	....
Macon, Ga.	11	8.5	7	....
Savannah, Ga.	10.5	8	7	....
Jacksonville, Fla.	9.5	7	8	....
Pensacola, Fla.	10.5	8	*9	....
Tampa, Fla.	9.5	7	8	....

Discounts to all tank wagon consumers: Effective Jan. 4, 1937, thru territory, on Crown gasoline, 3c per gal. below consumer t.w. price; on Kyso, 2.5c below, regardless of quantity purchased, per month.

**Taxes*: In the tax column is included these city and county gasoline taxes at the following points: Mobile, 2c city; Birmingham, 1c city; Montgomery 1c city and 1c county; Pensacola, 1c city. Georgia and Montgomery, Ala. have kerosine taxes of 1c per gal., and Mississippi 0.5c, not included in above prices.

Above prices include these inspection fees on both gasoline and kerosine, per gallon, figured on basis of 50 gallons per barrel:
Alabama, 1/40c on gasoline, 1/2c on kerosine; Arkansas, 1/5c per gal. in a single barrel, 1/20c per gal. in bulk; Florida, 1/8c; Illinois, 3/100c; Indiana, 1/5c per gal. in lots up to 25 bbls.; 2/25c per gal. in lots of 25 bbls. or more; Kansas, 1/50c, (3/50c can be charged to meet inspection department expenses); Louisiana, 1/32c; Minnesota, 1/25c; Missouri, 3/100c; Nebraska, 3/100c; Nevada, gasoline, 1/20c; North Carolina, 1/4c; North Dakota, 1/20c; Oklahoma, 2/25c per gal. lots of more than 50 in bbls., 1/5c in lots less than 50 bbls.; South Carolina, 1/8c; South Dakota, 1/10c; Tennessee, 2/5c; and Wisconsin, 3/100c on gasoline, 1/25c on kerosine.
Kerosine inspection fee only: Iowa, 3/50c; Michigan, 1/5c per gal.

TANK WAGON MARKETS

Tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes;** *they do, however, include inspection fees as shown in general footnote. Gasoline taxes shown in separate column, include 1c federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes, where levied, are indicated in footnotes. Discounts to various classes of buyers also are shown in footnotes. These prices in effect Sept.* **19, 1938,** *as posted by principal marketing companies at their headquarters offices, but subject to later correction.*

S. O. Indiana

Red Crown (*Regular Grade*)
Stanolind (*Third Grade*)

	Red Crown Cons. T.W.	Dealer Prices Red Crown T.W.	Stano-lind T.W.	Gaso-line Taxes	Kero-sine T.W.
Chicago, Ill.	11.6	9.6	6.4	4	10.5
Decatur, Ill.	11.6	10.1	8	4	10.5
Joliet, Ill.	11.6	10.1	8.4	4	10 5
Peoria, Ill.	11.6	10.1	9 6	4	10 5
Quincy, Ill.	11.4	9.9	8.8	4	10 3
Indianapolis, Ind.	12.3	10.8	8.9	5	*10.8
Evansville, Ind.	12.1	10.6	9.1	5	*11
South Bend, Ind.	12.6	11.1	9.2	5	*9
Detroit, Mich.	10.3	8.8	7.5	4	9
Grand Rapids, Mich.	9.5	8	9	4	9.7
Saginaw, Mich.	12.3	10.8	9.3	4	9 3
Green Bay, Wis.	12.4	10.9	10.2	5	10 3
Milwaukee, Wis.	11.8	10.3	9.5	5	10 7
La Crosse, Wis.	12	10.5	10	5	10 9
Minneapolis-St. Paul	12	10.5	10	5	10 9
Duluth, Minn.	12.4	10.9	10.4	5	11 3
Mankato, Minn.	12	10.5	10	5	10 9
Des Moines, Ia.	11.4	9.9	7 5	4	*10.3
Davenport, Ia.	11.6	10.1	9.6	4	*10.5
Mason City, Ia.	11.8	10.3	9.8	4	*10 7
St. Louis, Mo.	11.2	9.7	7.5	*4	10.1
Kansas City, Mo.	10.9	9.4	6.9	*4	8 5
St. Joseph, Mo.	10.9	9.4	8.9	*4	9 8
Fargo, N. D.	13.2	11.7	11.2	4	12 1
Minot, N. D.	14.5	13	12.5	4	13 4
Huron, S. D.	12.5	11	10.5	5	11.4
Wichita, Kans.	10.4	6.6	5.5	4	7.8

*Taxes: in the tax column is included these city and state gasoline taxes at following points: Kansas City, St. Joseph and St. Louis, 1c city tax. Kerosine taxes: Indiana has 4c, Iowa 3c per gal. state tax, not included in above prices.

Discount to commercial consumers: Effective Jan. 1, 1935, thru territory, except Michigan effective Feb. 1, on purchases per month, discount off t.w. prices; all gasolines, 25 to 1,000 gals., at t.w. price; 1,000 gals., or more, 1.5c off t.w. on Ethyl and Red Crown, and 1c on Stanolind (latter effective June 9, 1937). Minimum delivery is 25 gals.

S. O. Nebraska

Standard Red Crown Gasoline
(*Regular Grade*)

	T.W. Dealer	Gaso-line Taxes	Kero-sine T.W.
Omaha, Neb.	12	10.5	6	10.8
McCook	11.5	10.5	6	10
Norfolk	12.4	8.9	6	11.2
North Platte	12.4	9.4	6	11
Scottsbluff	13.5	8.4	6	12.3

Discounts to commercial consumers: for tank wagon deliveries covered only by Standard Commercial Consumer Contract, effective January 1, 1935.

S. O. Louisiana

Essolene
(*Regular Grade*)

	Consumer Tank Car	Dealer T.W.	Gaso-line Taxes	Kero-sine T.W.
Little Rock, Ark.	7.75	10.25	7 5	11
Alexandria, La.	7.25	9 75	8	*11.5
Baton Rouge, La.	7.25	9.75	8	* 9 5
New Orleans, La.	7.25	9.75	*10	*11 5
Lake Charles, La.	7.25	9 75	8	*11.5
Shreveport, La.	6	8.5	8	*10
Lafayette, La.	7.5	10	8	*11 5
Bristol, Tenn.	10.5	11	8	14.5
Chattanooga, Tenn.	10	12.5	8	14
Knoxville, Tenn.	10.5	13	8	14.5
Memphis, Tenn.	8.5	11	8	12.5
Nashville, Tenn.	9.5	12	8	13.5

*Taxes: New Orleans gasoline tax includes 7c state, 1c federal, and 2c parish tax. Louisiana has kerosine tax of 1c per gal.; in addition New Orleans has 1c parish tax, none of which are included in above prices.

Price basis to dealers: Undivided dealers get dealer price, less 0.5c.

Price basis to commercial consumers: Effective May 15, 1937, thru territory; commercial consumers taking 50 gals. or more at one time will be billed at posted consumer t.w. price; those taking less than 50 gals. at one time will be billed at 4c per gal. over posted consumer t.w. price. Generally, the posted consumer t.w. price will be equivalent to the dealer price less 0.5c per gal.

Humble Oil & Refining Co.

Humble Motor Fuel
(*Regular Grade*)

	*T.W.	S.S.	Gaso-line Taxes	Kero-sine T.W.
Dallas, Tex.	9	13	5	8
Ft. Worth, Tex.	9	13	5	8
Houston, Tex.	9.5	13.5	5	8
San Antonio, Tex.	9	13	5	8

U. S. Motor Gasoline
(*Third Grade*)

	*T.W.	S.S.	Gaso-line Taxes
Dallas, Tex.	6	10	5
Ft. Worth, Tex.	7	10	5
Houston, Tex.	7	11.5	5
San Antonio, Tex.	7.5	10.5	5

*Price is t.w. price to all classes of dealers and consumers.

Continental Oil

Conoco Bronze (*Regular Grade*)
Demand (*Third Grade*)

	—Dealer Prices— Conoco Bronz-e-z	De-mand	Gaso-line Taxes	Kero-sine T.W.
Denver, Colo.	10.5	9.5	5	11.5
Grand Junc., Colo.	14	13	5	15
Pueblo, Colo.	11.5	10.5	5	10.5
Casper, Wyo.	12	11	5	11.5
Cheyenne, Wyo.	8	7	5	13
Billings, Mont.	13	10	6	13
Butte, Mont.	13.5	10.5	6	15.5
Great Falls, Mont.	13	12	6	15.5
Helena, Mont.	14	13	6	15.5
Salt Lake City, Utah.	12	10	5	16
Boise, Ida.	15.5	11.5	6	18
Twin Falls, Ida.	15	12.5	6	18
Albuquerque, N. M.	11	10	†6.5	12
Roswell, N. M.	11	8 5	†6.5	10.5
Santa Fe, N. M.	12	9.5	*7	12
Muskogee, Okla.	9.5	7	5	7
Oklahoma City, Okla.	8.5	6.5	5	7
Tulsa, Okla.	7	5	5	7
Ft. Smith, Ark.	9 75	6 75	5	7.5
Little Rock, Ark.	9.75	8.125	7.5	8
Texarkana, Ark.	9	7	5	8

†Includes city tax of 0.5c.
*Includes 1c city tax.

S. O. California

Standard Gasoline
(*Regular Grade*)

	T.W.	S.S.	Gaso-line Taxes	Kero-sine T.W.
San Francisco, Cal.	13.5	14.5	4	11.5
Los Angeles, Cal.	13	14	4	10
Fresno, Cal.	14.5	15.5	4	12.5
Phoenix, Ariz.	15.5	16.5	6	*12.5
Reno, Nev.	15.5	16.5	5	13.5
Portland, Ore.	14	15	6	13.5
Seattle, Wash.	14	15	6	13.5
Spokane, Wash.	17	18	6	16.5
Tacoma, Wash.	14	15	6	13.5

Flight Gasoline
(*Third Grade*)

San Francisco, Cal.	12	13	4	....
Los Angeles, Cal.	11.5	12.5	4	....
Fresno, Cal.	13	14	4	....
Reno, Nev.	14	15	5	....
Phoenix, Ariz.	14	15	6	....
Portland, Ore.	12.5	13 5	6	....
Seattle, Wash.	12.5	13 5	6	....
Spokane, Wash.	15 5	16 5	6	....
Tacoma, Wash.	12.5	13.5	6	....

*Arizona has kerosine tax of 5c per gal., not included in above prices.

Discount to dealers: on gasoline, off t.w. price on Standard Ethyl and Standard Gasoline, to 100% dealers, 3c; to split dealers, 2c; on Flight gasoline, both 100% and split dealers, 2c.

On Stanavo Aviation Gasoline, to all classes of dealers, 3c off t.w.

To commercial consumers: off tank wagon price: on single deliveries of 40 gallons and over, Stanavo Aviation, Standard Ethyl and Standard Gasolines, 3c. Flight Gasoline, 2c per gallon. Tank wagon delivery, less than 40 gals., 1c per gal. above posted t.w. price. Discounts on kerosine: in tank cars, 3c off tank truck price; plant deliveries to jobbers, 2.5c below tank truck price.

Canada

PRICES OF IMPERIAL OIL LTD.
Per Imperial Gallon, which is 1.2 U. S. Gallons

3-Star Imperial Gasoline
(*Regular Grade*)

	T.W	Gasoline Taxes	Kero-sine T.W.
Hamilton, Ont.	16	6	17
Toronto, Ont.	16	6	17
Brandon, Man.	21.1	7	22.3
Winnipeg, Man.	20.5	7	20.7
Regina, Sask.	19	7	22
Saskatoon, Sask.	21.3	7	24.8
Edmonton, Alta.	19.5	7	21.5
Calgary, Alta.	16.5	7	19
Vancouver, B. C.	16	7	23
Montreal, Que.	15	6	17.5
St. John, N. B.	14.5	10	18.5
Halifax, N S.	14.5	10	18.5

Discounts to undivided dealers, 1c off t.w. price, except Maritime Provinces where undivided dealers pay t.w. price. Divided dealers pay t.w. price, thru territory.

Aviation Gasoline

Following are tank car, tank wagon or dealer prices, as indicated, of aviation gasoline in several marketing territories.

S. O. OHIO
Thru Ohio
Esso Aviation

	Consumer T.W.	Gasoline Taxes
74 octane	15.5	5
80 octane	16.5	5
87 octane	17.5	5

Discounts: For delivery on contract to hangar operators and resellers: 2c below consumer posted t.w. price, shown above.

S. O. INDIANA
Stanavo Ethyl Aviation Gasoline
73 Octane Number

Chicago, Ill.	14.9	4
Detroit, Mich.	16 5	4
Milwaukee, Wis.	15 1	5
Minneapolis, Minn.	15 3	5
St. Louis, Mo.	14.5	3
Kansas City, Mo.	14 2	*4
Fargo, N. D.	16 5	4
Huron, S. D.	15.8	5

*Includes 1c city tax.

HUMBLE OIL & REFINING CO.
Aviation Gasoline

	Tank Car
Baytown, Tex.	8.5

CONTINENTAL OIL CO.
Conoco Special Gasoline

	Dealer	Gasoline Taxes
Denver, Colo.	14 5	5
Cheyenne, Wyo.	15	5
Helena, Mont.	17	6
Salt Lake City, Utah.	17.5	5
Albuquerque, N. M.	14	*6.5

*Includes city tax of 0.5c.

S. O. CALIFORNIA
Stanavo Aviation Gasoline

	T.W.	
Phoenix, Ariz.	17.5	6
Los Angeles, Cal.	15	4
San Francisco, Cal.	15 5	4
Reno, Nev.	17.5	5
Portland, Ore.	16	6
Seattle, Wash.	16	6
Spokane, Wash.	19	6

Note: For discounts, etc., see note under Standard and Flight gasoline above.

Naphtha (In Tank Wagon)

S. O. NEW JERSEY

	Posted Tank Wagon Prices Mineral Spirits	V.M.&P.
Newark, N. J.	11 5	15.5
Baltimore, Md.	15 5	....
Washington, D. C.	15	....

Discounts: Buyers taking following quantities, at one time, get these discounts: Newark, 2c per gal. on 200 gals. or more; less than 200 gals., 0.5c higher price. Baltimore 2c off on 25 to 100 gals. and 3c on over 100 gals. Washington, 2c off to contract buyers.

SOCONY-VACUUM OIL CO.

Buffalo, N. Y.	11	12.5
*New York City	9.5	10.5
Rochester, N. Y.	12	12.5
Syracuse, N. Y.	12 5	15
Boston, Mass.	11.5	11.5
Bridgeport, Conn.	11	11.5
Hartford, Conn.	11	11.5
Providence, R. I.	11.5	12.5

*Prices apply to consumers only in quantities over 1,000 gals. annually. For quantities under 1,000 gals. annually, add 0.5c per gal.

ATLANTIC REFINING CO.

Philadelphia, Pa.	11.5	12.5
Lancaster, Pa.	13	14
Pittsburgh, Pa.	12.5	14.5

Note: Prices for Mineral Spirits also apply to Stoddard Solvent; and prices for V.M.&P. Naphtha apply also to Light Cleaners Naphtha.

S. O. OHIO

	S.R. Solvent	V.M.&P. Naphtha
Thru Ohio	12.5	13.5

Note: V.M.&P. Naphtha prices also apply on Dry Cleaners naphtha and special Varnolene; Varnolene and Sohio Solvent 0.5c below these prices. Discounts to contract consumers, off t.w. price: 300 to 999 gals., 0.5c; 1,000 to 2,499 gals., 0.75c; 2,500 to 4,999 gals., 1c; 5,000 or more gals., 1.5c.

TANK WAGON MARKETS

Tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes;** *they do, however, include inspection fees as shown in general footnote. Gasoline taxes, shown in separate column, include* 1c *federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes, where levied, are indicated in footnotes. Discounts to various classes of buyers also are shown in footnotes. These prices in effect Sept.* 19, 1938, *as posted by principal marketing companies at their headquarters offices, but subject to later correction.*

S. O. INDIANA

(Prices include state and federal taxes)

	Oleum Spirits	V.M.&P. Naphtha	Stanisol
Chicago, Ill.	16.2	16 5	15.9
Detroit, Mich.	19.2	18 7	19 7
Kansas City, Mo.	13.9	14.9	14 4
St. Louis, Mo.	14.2	15 2	12.9
Milwaukee, Wis.	18.8	19.8	19 3
Minneapolis, Minn.	19	20	17.7

Note: All prices, with exception of Missouri points, include state tax. Prices shown are base prices, before discounts.

Naphtha (In Tank Cars)

In Tank Cars (F. o. b. refinery or seaboard terminal except Ohio, delivered price.)

	V.M.&P. Naphtha	Solvent
Baltimore	10.5	9.5
New York Harbor	10	9
Philadelphia district	10.5	9
Boston	10 5	9.5
Providence	10.5	9.5
Ohio points, delivered	8.875	*8

*This is on rubber solvent.

Note: In Ohio, prices on D.C. naphtha and special. Varnolene are same as V.M.&P.; on Varnolene and Sohio Solvent, prices are 0.5c less than on V.M.&P

Latest Changes

From Sept. 13 to Sept. 19 inclusive. Dates and amounts of changes shown. See table for full current prices.

Socony-Vacuum Oil—Kerosine:
Providence cut 0.5c, Sept. 13.

Atlantic Refining—White Flash Gasoline:
Dover, Del. dealer t. w. cut 1c, Sept. 15.
Trenton dealer t. w. cut 0.5c, Sept. 14.

Humble Oil & Refg.—U. S. Motor Gasoline:
Ft. Worth t. w. up 1c, Sept. 15.

Corrections

Notation of amount of change and dates not previously shown in table. Table in this issue is corrected to show these changes.

Socony-Vacuum—Socony Mobilgas:
Details of Sept. 9 cut on consumer t. c. and dealer t. w., preliminary report of which was published in Sept. 7 issue, page 12, are: New York City, all boroughs, t. c. only cut 0.25c; Albany, Plattsburg, Danbury, New Haven, Boston, Manchester and Providence, cut 0.5c both t. c. and dealer t. w.; Binghamton and Hartford, t. c. only 0.5c; Buffalo, t. c. 0.3c, t. w. 0.4c; Jamestown, t. c., 0.3c, t. c. 0.8c; Rochester, 0.3c on both; Syracuse, t. c. only 0.2c; Bangor, t. c. 0.5c, t. w. 0.8c; Portland, t. c. 0.5c, t. w. 1c; Concord, t. c. 0.5c, t. w. 0.6c; Lancaster, t. c. 0.7c, t. w. 0.8c; Burlington, t. c. 0.75c, t. c. 0.7c; Rutland, t. c. 0.6c, t. w. 0.7c.

S. O. Indiana—Red Crown:
Grand Rapids dealer price cut 1.3c, Sept. 12.

Stanolind:
Grand Rapids dealer price cut 1.8c, Sept. 12.

S. O. Nebraska—Standard Red Crown:
Norfolk dealer price cut 2c, Sept. 9.

Heating Oils

Socony-Vacuum—Nos. 2, 3 & 4:
Cut 0.5c, Bangor, Sept. 9.

Fuel Oil

(*Continued from page* 53)

ing to reports during the week ended Sept. 17.

Occasional reports of lower-priced offerings of kerosine and No. 1 fuel in the New York harbor and Boston markets were encountered, but prices generally in these markets were said to be fairly stable.

* * *

CHICAGO, Sept. 19.—Gradually increasing demand for all grades of burner fuels was reported by Chicago tank car marketers the past week. All grades, and particularly Nos. 2 and 3, were said to be difficult to obtain in the Mid-Continent field.

Offerings of Michigan light fuels also were reported limited. Refiners said they were storing most of their current production for winter.

Heavy fuels continued without feature in the Chicago area, reports indicated. Michigan industrial fuels were somewhat easier, although quotations generally were unchanged, refiners said.

Wax

NEW YORK, Sept. 19.—Wax continued to rock along at the pace it has been going for the past month or more, both as to demand and prices, during the week ended Sept. 17.

There was some speculation, but very few conclusions, among wax traders here as to the possible effect a European war would have on the American wax market. One trader, however, said that a war of the consequence now threatened should result in a heavy export call for American wax for munitions purposes.

CHICAGO, Sept. 17.—Pure Oil Co. has scheduled Red Grange, the famous football star, to give football news twice a week, starting Sept. 22, over 11 CBS stations: Akron, Cincinnati, Charleston, Columbus, Dayton, Fairmont, Indianapolis, Richmond, Roanoke, Wheeling and Parkersburg. Two 15-minute programs will be heard Thursdays and Saturdays at 6 p.m.

Welders To Meet

CLEVELAND, Sept. 20.—Nearly all phases of welding engineering will be covered during the nineteenth annual meeting and welding exposition of the American Welding Society in Detroit Oct. 16-21. Both arc welding and oxy-acetylene welding are included in the subject matter of the meeting.

The welding of special steels and alloys is to be given considerable attention at the meeting. The various speakers will discuss carbon molybdenum steel pipe, nickel-iron alloys, medium carbon steel, aluminum and aluminum alloys, bronze, copper, silicon bronzes, and low-carbon and stainless steels.

Another general heading is the technique of welding in a number of specialized fields. The third main division might be termed studies of the quality of welds. Some attention is also to be directed to general alvances in welding. While no subjects are directed specifically toward petroleum industry problems many have an application to these problems.

TANK WAGON MARKETS, HEATING OILS

Prices in Effect Sept. 19, 1938

Following are posted tank wagon prices of various grades of heating oil at the points shown in various territories. Prices are in cents per gallon.

	No. 1	No. 2	No. 4
S. O. NEW JERSEY			
Atlantic City, N. J.	8.0	6.0	6.0
Newark	8.0	6.0	6.0
Annapolis, Md.	....	6.25	....
Baltimore	7.0	6.0	5.5
Washington, D. C.	7.25	6.5	6.5
Norfolk, Va.	7.0	6.0	6.0
Petersburg	7.25	6.25	....
Richmond	7.25	6 25	6.25
Charlotte, N. C.	8.75	7.75	....
Hickory	....	8.25	....
Raleigh	8.75	7.25	....
Charleston, S. C.	8.5	7.0	....
Columbia	9.8	8.3	....
Spartanburg	10.7	9.2	....

SOCONY-VACUUM OIL CO. INC.
(S. O. New York Division)

	No. 2	No. 3	No. 4
New York City	6.50	6.50	6.50
Albany, N. Y.	7.00	7.00	6.50
Rochester, N. Y.	7 50	7.50	7.50
Boston, Mass.	6.00	6.00	6.00
Bangor, Me.	7.0	7.0	7.0
Manchester, N. H.	6.50	6 50	6.50
Burlington, Vt.	8 00	8.00	8.00
Hartford, Conn.	6.00	6.00	6.00
New Haven, Conn.	5.25	5.25	5.25
Providence, R. I.	6 00	6.00	6.00

Note: Prices for No. 1 fuel in Socony-Vacuum territory same as for kerosine which see in tank wagon table for various cities; prices change with kerosine.

	No. 1	No. 2	No. 3	No. 4
ATLANTIC REFINING Cont'd				
Philadelphia, Pa.	7.75	6.00	6.00	6.00
Allentown, Pa.	8.50	6.50	6.50	6.50
Wilmington, Del.	7.75	6.00	6.00	6.00
Springfield, Mass.	8.00	6.50	....	6.50
Worcester, Mass.	8.00	6.00	....	6.00
Hartford, Conn.	7.00	6.00	....	6.00
S. O. OHIO				
Columbus Division and Cleveland	7.50	7.50	7.00	....
City of Lima	8.00	8.00	7.00	....
Rest of Ohio	8.00	8.00	7.50	....

Note: S. O. Ohio prices are for full compartment hose dumps, bucket dumps are 0.5c *per gallon higher.*

S. O. INDIANA
Stanolex Fuel and Furnace Oils

	No. 1 Fuel	Stanolex Furnace
Chicago	(a)6.5	6.5
Indianapolis	...	(b)7.8
Detroit	...	7.1
Milwaukee	8.4	7.7
Minneapolis	7.8	7.8
St. Louis	7.7	7.0
Kansas City	6.8	6.8

(a) For 400 gals. and over; 150 to 399 gals., 7c; 1 to 149 gals., 8c.
(b) Excluding 4c state tax.
Note: Small-lot deliveries of light fuel oils range up to 2c *higher than above quotations.*

SEABOARD MARKETS, EXPORT AND COASTWISE

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days). In cargo markets, spot shipment is 90 days. Prices in cents per gallon, except heavy fuel oil in dollars per barrel, in tank car lots, f.o.b. refineries or seaboard terminals in districts designated, unless otherwise noted. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude. Unless otherwise noted, gasoline octane ratings are determined by C.F.R. Motor method, A.S.T.M. D-357-33T; and lubricating oil specifications determined according to A.S.T.M. methods, unless otherwise noted.

Eastern Domestic

(Inter-refinery and export prices not included.)

MOTOR GASOLINE

Prices Effective	Sept. 19	
District:	(a) 60-64 Oct.	(a) 65 Oct. & Above
N. Y. harbor	6.25 – 6.75	6.25 – 6.75
(b) N. Y. harbor	6.00 – 6.50	6.00 – 6.50
Philadelphia	6.00 – 6.50	6.00 – 6.50
Baltimore	6.25 – 6.50	6.50 – 6.75
Norfolk	6.75 – 7.00	7.00 – 7.25
Wilmington, N. C.	6.75 – 7.00	7.00 – 7.25
Charleston, S. C.	6.75 – 7.00	7.00 – 7.25
Savannah	7.00 – 7.25	7.00 – 7.25
Jacksonville	7.00 – 7.25	7.00 – 7.25
Portland	7.00 – 7.50	7.00 – 7.50
Boston	6.25 – 7.00	6.50 – 7.00
Providence	6.25 – 7.00	6.50 – 7.00

WATER WHITE KEROSINE

District:			
N. Y. harbor	4.75 –5.00	Charleston	5.00–5.25
(b) N. Y. harbor	4.625–4.875	Savannah	5.25–5.50
Philadelphia	5.00–5.25	Jacksonville	5.25–5.50
Baltimore	5.00–5.25	Portland	5.60
Norfolk	5.00–5.25	Boston	5.00
Wilmington, N.C.	5.00–5.25	Providence	4.75–5.00

(c) FUEL OILS

	N. Y. harb.	N. Y. harb. barges
No. 1	4.75 – 5.00	4.625– 4.875
Nos. 2-3	4.25	4.125
No. 4	4.00 – 4.25	3.875– 4.125
No. 5	(s)$1.15	.....
No. 6	$0.85 –$0.95	.....

	Phila. dist.	Balt. dist.
No. 1	5.00 – 5.25	5.00 – 5.25
Nos. 2-3	4.25	4.25
No. 4	4.00	4.00 – 4.25
No. 5	$1.15	$1.15
No. 6	$0.95	$0.95

	Bost. dist.	Prov. dist.
No. 1	5.00	4.75 – 5.00
Nos. 2-3	4.25	4.25
No. 4	4.00 – 4.25	4.00 – 4.25
No. 5	$1.15	$1.15
No. 6	$0.95	$0.95

District:	(d) Bunker C Fuel	(d) Diesel Oil
N. Y. harbor	(f)$0.95	(g)$1.75
Philadelphia	(f)$0.95	(g)$1.75
Baltimore	(f)$0.95	(g)$1.55
Norfolk	(e)$0.95	$1.75
Charleston	$0.90	$1.75
Savannah	(e)$0.90	$1.785
Jacksonville	(e)$0.90	$1.785
Tampa	(e)$0.85	$1.785
Portland	$1.05	$1.85
Boston	(f)$0.95	(g)$1.75
Providence	$0.95	$1.75

	Gas Oil 28-34 Gravity	Diesel Oil Shore Plants
N. Y. harbor	4.00 – 4.25	4.00 – 4.25
Philadelphia dist.	4.25	....
Baltimore dist.	4.25	....
Norfolk dist.	4.25	....
Savannah dist.	....	4.25
Jacksonville dist.	....	4.25

Pacific Export

(i) (Quotations are at seaboard, Los Angeles, in cargo lots, cents per gal., except where otherwise noted.)

Prices Effective	Sept. 19	Sept. 12
U. S. Motor, under 65 oct.	4.875– 5.00	4.875– 5.00
400 e.p. blend, under 65 oct.	5.00 – 5.125	5.00 – 5.125
400 e.p. blend 65 oct. & above	5.125– 5.375	5.125– 5.375
(h) 38-40 w.w. kerosine	4.25 – 4.75	4.25 – 4.75
41-43 w.w. kerosine	4.75 – 5.00	4.75 – 5.00
44 w.w. kerosine	5.25 – 5.50	5.25 – 5.50
In Cargo lots, per bbl.		
Dieselfuel, 24° & above	$1.05 –$1.20	$1.05 –$1.20
Diesel fuel, under 24°	$0.95 –$1.05	$0.93 –$1.05
(h) 30-34 diesel (gas oil)	$1.25 –$1.30	$1.20 –$1.30
(k) Grade C fuel oil	$0.55 –$0.70	$0.55 –$0.70

Prices Effective	Sept. 19	Sept. 12
In Ships' Bunkers, or deep tank lots, per bbl.:		
(j) Diesel fuel oil	$1.525–$1.55	$1.525–$1.55
(k) Grade C fuel oil	$0.70 –$0.90	$0.70 –$0.90
Cased Goods: (Per case)		
U. S. Motor	$1.40 –$1.525	$1.40 –$1.525
400 e.p. blend, under 65 octane	$1.50 –$1.60	$1.50 –$1.60
375–400 e.p. blend, 65 oct. & above	$1.60 –$1.70	$1.60 –$1.70
(h) 40-43 w.w. kerosine	$1.30 –$1.40	$1.30 –$1.40
Kerosine, p.w.	$1.25 –$1.35	$1.25 –$1.35

New York Export

(Cents per gal. in bbls. F.a.s. New York)

CYLINDER OILS (Pennsylvania Products)

Bright stock:		
Light, 25 p.t.	21.50	21.50
Neutral oil:		
200 3 color, 25 p.t.	22.50	22.50
150 3 color, 25 p.t.	21.50	21.50
600 s.r., unfiltered	15.50 –16.50	15.50 –16.50
650 s.r., unfiltered	17.50 –18.50	17.50 –18.50
600 fl., s.r.	18.00 –19.00	18.00 –19.00
630 fl., s.r.	20.50 –21.50	20.50 –21.50

Wax, Domestic *and* Export

(A.S.T.M. Tests. Melting points, however, are A.M.P., 3° higher than E.M.P. Export prices, f.a.s., carloads. Domestic prices, f.o.b. refineries in New Orleans & New York districts in bags, carloads, with 0.2c discount allowed for shipment in bulk, except where noted below. Scale solid; fully refined, slabs in bags)

Prices Effective	Sept. 19	
	New York	
	Domestic	Export
124-6 Y.C. scale	2.35 – 2.50	2.35 – 2.50
122-4 W.C. scale	2.35 – 2.50	2.35 – 2.50
124-6 W.C. scale	2.35 – 2.50	2.35 – 2.50
123-5 Fully rfd.	3.75	3.375– 3.50
125-7 Fully rfd.	3.90	3.50 – 3.625
128-30 Fully rfd.	(l)4.00	3.65 – 3.875
130-2 Fully rfd.	(l)4.35	4.00 – 4.125
133-5 Fully rfd.	(l)4.65	4.40 – 4.625
135-7 Fully rfd.	(l)4.90	5.00 – 5.125
	New Orleans	
	Domestic	Export
124-6 Y.C. scale	2.35 – 2.50	2.35 – 2.50
122-4 W.C. scale	2.35 – 2.50	2.35 – 2.50
124-6 W.C. scale	2.35 – 2.50	2.35 – 2.50
123-5 Fully rfd.	3.75	3.375– 3.50
125-7 Fully rfd.	3.90	3.50 – 3.625
128-30 Fully rfd.	(l)4.00	3.65 – 3.875
130-2 Fully rfd.	(l)4.35	4.00 – 4.125
133-5 Fully rfd.	(l)4.65	4.40 – 4.625

Gulf Coast

(F.o.b. ship, Gulf oil terminals; minimum 20,000 bbls.; representing traders' opinions)

Prices Effective	Sept. 19	Sept. 12
For Domestic shipment:		
MOTOR GASOLINE		
59 oct. & below	4.625– 4.875	4.625– 4.875
60-64 oct.	4.75 – 5.00	4.75 – 5.00
65-67 octane	4.875– 5.125	4.875– 5.125
68-70 octane	5.125– 5.50	5.25 – 5.50
FUEL OILS		
No. 1	3.75 – 4.00	3.75 – 4.00
No. 2	3.50	3.50
KEROSINE		
41-43 w.w.	4.00	4.00
For Export Shipment:		
GASOLINE		
U. S. Motor	4.625– 4.75	4.625– 4.75
60-62, 400 e.p.	4.625– 4.75	4.625– 4.75
61-63, 390 e.p.	4.625– 5.00	4.625– 5.00
64-66, 375 e.p.	4.625– 5.00	4.625– 5.00
KEROSINE		
44 w.w.	(a) 4.25 –4.50	(a) 4.25 –4.50
41-43 w.w.	4.00	4.00
41-43 p.w.	4.00	4.00

Prices Effective	Sept. 19	Sept. 12
GAS AND BUNKER OILS		
For Export Shipment		
Gas Oil (m):		
Below 43 diesel index	3.50	3.50
43-47 diesel index	3.50 – 3.625	3.50 – 3.625
48-52 diesel index	(a) 3.50 –3.625	(a) 3.50 –3.625
53-57 diesel index	(a) 3.625–3.75	(a) 3.625–3.75
For Domestic and/or Export Shipment		
Diesel Oil Ship's bkrs.	(o)$1.55	(o)$1.55
Grade C bunker oil for ship's bunkers	(o)$0.75	(o)$0.75
Grade C bunker oil, in cargoes	$0.60 –$0.65	$0.60 –$0.65

MID-CONTINENT LUBRICATING OILS

(Cents per gal. at Gulf; in bbls., f.a.s.; in bulk, f.o.b. terminals)

	Sept. 19	
190-200 vis. D. 210 brt. stock	(p) Barrels 22.50 –24.50	Bulk 17.60 –17.75
150-160 vis. D 210 brt. stock:		
0-10 p.p.	19.00 –20.50	13.00 –14.75
10-25 p.p.	18.50 –20.00	12.50 –14.25
150-160 vis. E 210 brt. stock	18.50 –20.00	13.00 –14.50
120 vis. D 210 brt. stock	18.50 –20.00	13.00 –14.50

	Sept. 19	Sept. 12
180 vis. No. 3 color neutral:	Bulk	Bulk
0-10 p.p.	10.00 –10.50	10.00 –10.50
15-30 p.p.	9.50 –10.00	9.50 –10.00
200 vis. No. 3 color neutral:		
0-10 p.p.	10.00 –10.50	10.00 –10.50
15-30 p.p.	9.50 –10.00	9.50 –10.00
600 s.r. olive green	9.00 –11.25	9.00 –11.25
600 s.r. dark green	7.00 – 9.25	7.00 – 9.25

SOUTH TEXAS LUBRICATING OILS

(Vis. at 100° cold test 0, bulk export shipment, f.o.b. terminals.)

Vis.	Color		
Unfiltered Pale Oils:			
100	No. 3	4.75 – 5.00	4.75 – 5.00
200	No. 3	6.25 – 6.75	6.25 – 6.75
300	No. 3	6.75 – 7.25	6.75 – 7.25
500	No. 3½	7.75 – 8.25	7.75 – 8.25
750	No. 4	8.25 – 8.75	8.25 – 8.75
1200	No. 4	8.75 – 9.25	8.75 – 9.25
2000	No. 4	9.00 – 9.50	9.00 – 9.50
Red Oils:			
100	No. 5-6	4.75 – 5.00	4.75 – 5.00
200	No. 5-6	6.25 – 6.75	6.25 – 6.75
300	No. 5-6	6.75 – 7.25	6.75 – 7.25
500	No. 5-6	7.75 – 8.25	7.75 – 8.25
750	No. 5-6	8.25 – 8.75	8.25 – 8.75
1200	No. 5-6	8.75 – 9.25	8.75 – 9.25
2000	No. 5-6	9.00 – 9.50	9.00 – 9.50

Note: Red oil prices cover oils with green cast; prices for blue cast red oils are slightly lower in some cases.

Tanker Rates

(Approximate freight rates to Continental ports, shillings per ton of 2240 lbs., British sterling; U.S. ports cents per bbl.)

Rates Effective Sept. 19

	Crude &/or Fuel		Refined Oil &/or Spirits	
	Last Paid	Owners Ask	Last Paid	Owners Ask
Gulf-U.K./Cont. (q)	11/9	12/-12/6	12/	12/6-13/
Aruba-U.K./Cont. (q)	9/3	10/-10/6	10/	10/6-11/
Gulf-N. Atlantic (r) (not E. of N.Y.):				
Hvy. Crude & fuel, (10 to 19.9 gravity)	17.5c	19c	....	....
Light Crude, (30 Grav. or Lighter)	15c	15-16c	....	....
Gasoline	....	....	15c	16-17c
Kerosine	....	....	15c	16-17c
Light Fuel	....	....	16c	16-17c

(a) Prices nominal. (b) In barge lots. (c) Fuel oils meet specifications of U. S. Commercial Standards CS12-35. (d) In ships' bunkers. (e) For barging, add 5c per bbl. (f) For barging, add 5c to 6c per bbl. (g) For barging, add 6.5c to 7.5c per bbl. (h) 150 fire point. (i) For San Francisco cargo prices, add 5c per bbl. to cargo prices shown above. (j) Pacific Specification 200. (k) Pacific Specification 400. (l) Shipment either in bags or in bulk. (m) Less than ½ of 1% sulfur. (n) No prices reported. (o) Barging 5c per bbl. additional at some Gulf ports. (p) Second-hand barrels. (q) Continental ports in range between Bordeaux and Hamburg, both inclusive. (r) Venezuela loading, same rate; Tampico, 2c to 3c per bbl. additional. (s) Low pour test, low viscosity, No. 5 generally quoted at $1.25.

CRUDE OIL MARKETS

Prices in $ per bbl. of 42 U. S. gals. at the well. A. P. I. gravity. Prices are effective as of 7 a. m. of dates as ven

EASTERN FIELDS

Posted by Joseph Seep Purchasing Agency

(Effective Sept. 1, 1938, except Corning Sept. 3, 1938)

Penna. Grade Oil in Southwest Penna. Pipe Lines.....$1.34
Penna. Grade Oil in Eureka Pipe Lines (West Virginia).....$1.28
Penna. Grade Oil in Buckeye Pipe Lines (Macksburg, O.).....$1.18
Corning Oil in Buckeye Pipe Lines (Ohio)...$1.07

Posted by Other Companies

Tide Water Associated Oil Co.
Bradford-Allegany district (Penna. and N. Y.) (Effective Sept. 1, 1938).....$1.68
*The Pennzoil Co.: (Effective Sept. 1, 1938)
Penna. Grade Oil in National Transit Lines*$1.61
Ashland Oil & Transportation Co.:
Somerset Oil in Ashland Lines (Ky.):
(Effective July 1, 1938)
Big Sandy River.....$1.32
Kentucky River.....$1.40

*The Pennzoil Co. posts $1.61 in Cochran, Franklin, Hamilton and Doolittle, Pa. fields; prices in other lower districts range down to $1.56 per bbl. at well.

MICHIGAN

Posted by Pure Oil Co.

Midland, Midland County (Jan. 5, 1938)....$1.12

Posted by Simrall Corp.

(Effective Aug. 9, 1938)
West Branch, Arenac, and equal grades.....$0.90
(Effective Jan. 8, 1938)
Allegan, Crystal, Greendale, Porter and equal grades.....$1.12
Beaverton, Buckeye, Bentley, Edenville and Freeman.....$1.095

CENTRAL STATES FIELDS

Posted by Ohio Oil Co.

(Effective Jan. 28, 1937)
Illinois, Princeton.....$1.35
(Effective June 22, 1938)
Owensboro, (Western Ky.).....$1.30
(Effective Nov. 20, 1937)
Lima, O.....$1.00

Posted by Owensboro Corp.

Illinois:
Beecher City (Effective Nov. 5, 1937).....$1.35
Centralia Field:
Congested District (Effective Aug. 8, 1938) .$1.10
Area Outside Congested District (Effective May 25, 1938).....$1.25

Posted by Carter Oil Co.

(Effective Sept. 1, 1938)
Louden, Fayette County.....$1.35

Posted by Stoll Oil Refining Co.

(Effective Sept. 10, 1938)
Stoll Pipe Line Oil (Ky.).....$1.20

Posted by Fordsville Gathering Line, Inc.

(Effective June 23, 1938)
Birk City Field, Ky.....$1.25
Owensboro District, Ky..... 1.30

CANADIAN FIELDS

Posted by Imperial Oil Limited
Western Ontario
(Effective Sept. 9, 1933)
Petrolia.....$2.10
Oil Springs.....$2.17

Alberta—Turner Valley
(Prices f.o.b. field tankage)
(Effective Jan. 5, 1938)

Crude Oil			
40-40.9°.....	$1.14	53-53.9.....	$1.40
41-41.9.....	1.16	54-54.9.....	1.42
42-42.9.....	1.18	55-55.9.....	1.44
43-43.9.....	1.20	56-56.9.....	1.46
44-44.9.....	1.22	57-57.9.....	1.48
45-45.9.....	1.24	58-58.9.....	1.50
46-46.9.....	1.26	59-59.9.....	1.52
47-47.9.....	1.28	60-60.9.....	1.54
48-48.9.....	1.30	61-61.9.....	1.56
49-49.9.....	1.32	62-62.9.....	1.58
50-50.9.....	1.34	63-63.9.....	1.60
51-51.9.....	1.36	64-64.9.....	1.62
52-52.9.....	1.38		

Crude Naphtha, 65 grav. & above.....$2.14

Absorption Gasoline	
90% Rec., 20 lb. Reid v.p.	$1.94
90% Rec., 17 lb. Reid v.p.	$2.08

†MID-CONTINENT

(Effective Jan. 28, 1937)

	(In Oklahoma- *Kansas)	(In North-North Central Texas)
Below 29.....	$1.06	$0.96
29-29.9.....	1.08	0.98
30-30.9.....	1.10	1.00
31-31.9.....	1.12	1.02
32-32.9.....	1.14	1.04
33-33.9.....	1.16	1.06
34-34.9.....	1.18	1.08
35-35.9.....	1.20	1.10
36-36.9.....	1.22	1.12
37-37.9.....	1.24	1.14
38-38.9.....	1.26	1.16
39-39.9.....	1.28	1.18
40 & above....	1.30	1.20

†Prices posted by Standard Oil Co. (Indiana) in Okla.-Kans., and in Texas by Stanolind Oil Purchasing Co.

Above prices met as follows:

Jan. 28, Continental Oil Co. met in Okla., Kans., and North Texas. Sinclair-Prairie met in North Texas and North Central Texas, Jan. 28, Stanolind's North Texas schedule. Same date, The Texas Co. met in North-North Central Texas.

Effective June 16, 1938, Kanotex Refg. Co. posted Okla.-Kans. crude, 34 & below, at $1.03, 35-35.9 at $1.05, plus 2c differential to 40 & above, at $1.15.

Effective Sept. 1, 1938, Rock Island Oil Co. cut southern Okla. crude, in Stephens, Carter and Garvin counties, 10c, posting 20-20.9 at $0.65, plus 4c differential to 25-25.9 inclusive; from 26-26.9 to 30-30.9 inclusive, 3c differential; and from 31-31.9 to 40 and above, 2c differential, with 40 & above being $1.20.

Note: S. O. Indiana prices in Okla.-Kans. are for quantities computed by 97% tank tables. In Texas, 100% tank tables are used effective Oct. 1, 1937, volume corrected to 60° F., and deduction for full b.s. & w. content.

*Effective Aug. 1, 1937, for Otis-Albert pools Rush-Barton counties, Kans., 13c less.

Posted by Carter Oil Co.
In Oklahoma
(Effective Jan. 28, 1937)

Below 25.....	$0.98	33-33.9.....	$1.16
25-25.9.....	1.00	34-34.9.....	1.18
26-26.9.....	1.02	35-35.9.....	1.20
27-27.9.....	1.04	36-36.9.....	1.22
28-28.9.....	1.06	37-37.9.....	1.24
29-29.9.....	1.08	38-38.9.....	1.26
30-30.9.....	1.10	39-39.9.....	1.28
31-31.9.....	1.12	40 and above...	1.30
32-32.9.....	1.14		

Above Carter schedule met Jan. 28 by the following companies: Sinclair-Prairie, Shell and Barnsdall in Oklahoma-Kansas; Skelly Oil in Kansas; Tide Water in Oklahoma; Pure Oil in Oklahoma-Kansas, beginning with below 24 at $0.98 and ending with 40 & above at $1.30.

Posted by Magnolia Petroleum Co.
(Effective Jan. 28, 1937)

In Oklahoma, same schedule as Carter Oil, which see above, beginning with below 25, at $0.98 and ending with 40 & above, at $1.30.

In Texas: North and North Central, including Burkburnett, Archer, Henrietta, Electra, Comanche and Olden, same gravity and price schedule as Stanolind in North Texas, which see under Stanolind, beginning with below 29 at $0.96 and ending with 40 and above, at $1.20.

	Jefferson County, Texas Beaumont (Magnolia) (Oct. 1, 1937)	West Beaumont (Humble) (May 1, 1938)
Below 21°.....	$0.95	$0.95
21-21.9.....	0.98	0.98
22-22.9.....	1.01	1.01
23-23.9.....	1.04	1.04
24-24.9.....	1.07	1.07
25-25.9.....	1.10	1.10
26-26.9.....	1.13	1.13
27-27.9.....	1.15	1.15
28-28.9.....	1.17	1.17
29-29.9.....	1.19	1.19
30-30.9.....	1.21	1.21
31-31.9.....	1.23	1.23
32-32.9.....	1.25	1.25
33-33.9.....	1.27	1.27
34-34.9.....	1.29	1.29
35-35.9.....	for	1.31
36-36.9.....	oil	1.33
37-37.9.....	34 & above	1.35
38-38.9.....		1.37
39-39.9.....		1.39
40 & above....		1.41

TEXAS FIELDS

Posted by Humble Oil & Refining Co.
(*West Central Texas)
(Effective Aug. 29, 1938)

28-28.9.....	$0.96	37-37.9.....	$1.14
29-29.9.....	0.98	38-38.9.....	1.16
30-30.9.....	1.00	39-39.9.....	1.18
31-31.9.....	1.02	40-40.9.....	1.20
32-32.9.....	1.04	41-41.9.....	1.22
33-33.9.....	1.06	42-42.9.....	1.24
34-34.9.....	1.08	43-43.9.....	1.26
35-35.9.....	1.10	44-44.9.....	1.28
36-36.9.....	1.12	45 & above.....	1.30

*Includes Brown, Callahan, Coleman, Comanche, Eastland, Fisher, Haskell, Jones, Shackelford, Stephens, Throckmorton and Young counties.

Note: Effective Oct. 1, 1937, Humble prices are based on 100% tank tables at 60F.

*East Central Texas
(Effective Jan. 28, 1937)

Below 29.....	$1.03	35-35.9.....	$1.17
29-29.9.....	1.05	36-36.9.....	1.19
30-30.9.....	1.07	37-37.9.....	1.21
31-31.9.....	1.09	38-38.9.....	1.23
32-32.9.....	1.11	39-39.9.....	1.25
33-33.9.....	1.13	40 and above...	1.27
34-34.9.....	1.15		

*Including Anderson, Cherokee, Limestone, Navarro counties.

Same date, Sinclair-Prairie met in Mexia Humble's above schedule.

PANHANDLE TEXAS

Posted by Humble Oil & Refining Co.

	Gray County	Carson-Hutchinson
(Effective Aug. 29, 1938)		
34-34.9.....	$0.96	$0.91
35-35.9.....	0.98	0.93
36-36.9.....	1.00	0.95
37-37.9.....	1.02	0.97
38-38.9.....	1.04	0.99
39-39.9.....	1.06	1.01
40-40.9.....	1.08	1.03
41-41.9.....	1.10	1.05
42-42.9.....	1.12	1.07
43-43.9.....	1.14	1.09
44-44.9.....	1.16	1.11
45 & above.....	1.18	1.13

EAST TEXAS

(Effective *Aug. 29-30-Sept. 1, 1938)
Gulf, Humble, Magnolia, Shell, Sinclair-Prairie, Stanolind, Sun, Texas Co., Tide-Water Associated $1.25

*Effective Aug. 29 by Gulf, Humble, Shell, Stanolind; Aug. 30 by Sinclair-Prairie, Texas, Tide Water; Sept. 1, Magnolia and Sun.

Shell also posted on Jan. 28, in Livingston area, Polk County, Texas, $1.27.

NORTHEAST TEXAS

(Posted by Humble, Jan. 28, 1937)

Talco.....$0.73

(Posted by Magnolia, Jan. 28, 1937)

Cass County and Panola County, Tex.:
Same gravity and price schedule as S. O. Louisiana posts for Rodessa, La., which see under that company

(Posted by The Texas Co., Jan. 28, 1937)

Cass County.....$1.25

WEST TEXAS AND NEW MEXICO

Posted by Humble Oil & Refining Co.
(Effective Jan. 28, 1937)
(Including Andrews, Crane, Crockett, Ector, *Gaines, Glasscock, Howard, *Reagan, Upton, Winkler and *Yoakum Counties, Texas and Lea county, New Mexico).

Below 26.....	$0.78	33-33.9.....	$0.94
26-26.9.....	0.80	34-34.9.....	0.96
27-27.9.....	0.82	35-35.9.....	0.98
28-28.9.....	0.84	36-36.9.....	1.00
29-29.9.....	0.86	37-37.9.....	1.02
30-30.9.....	0.88	38-38.9.....	1.04
31-31.9.....	0.90	39-39.9.....	1.06
32-32.9.....	0.92	40 & above.....	1.08
Pecos, West Texas.....			$0.91

*Added to this posting, Aug. 29, 1938.

Jan. 28, Magnolia met Humble in Crane, Upton, Howard, Glasscock, Mitchell and Winkler.

Shell Petroleum Corp., on Jan. 28, met Humble in Crane, Glasscock, Howard, Pecos (except Yates shallow pool), Winkler, and Upton counties, Tex., and in Lea County, N. Mex. On Jan. 28, Shell posted in Yates shallow pool in Pecos county, Tex., $0.81. June 4, 1937, Shell added Ector county to West Texas postings.

Jan. 28, Stanolind Oil Purchasing Co. met Humble in Hendrick field, Winkler county.

Jan. 28, Texas Co. met Humble in Ward and Winkler counties, Tex., and Lea County, N. M. except that its top grade is 36 and above, at $1.00.

April 20, 1937, Sinclair Prairie met Humble in Ward and Winkler, Tex. and Lea, N. M., counties, except that its gravity schedule ends with 36 and above, at $1.00.

Posted by Continental Oil Co.
(Effective Jan. 28, 1937)
Artesia, Jackson and Maljamar pools, N. M...$0.90

COLORADO

(Posted by Continental Oil Co.)
(Effective Jan. 28, 1937)

	Ft. Collins and Wellington		
Below 29.....	$1.01	35-35.9.....	$1.15
29-29.9.....	1.03	36-36.9.....	1.17
30-30.9.....	1.05	37-37.9.....	1.19
31-31.9.....	1.07	38-38.9.....	1.21
32-32.9.....	1.09	39-39.9.....	1.23
33-33.9.....	1.11	40 & above.....	1.25
34-34.9.....	1.13		
Canon City and Florence, Col.....			$1.10

SOUTH AND SOUTHWEST TEXAS

All Shown Below Posted by Humble Oil & Refining Co.
(Effective Jan. 28, 1937)
Carroll, Clark, Darst Creek, Hilbig, Salt Flat and Zoboroski fields.....$1.09
Van Zandt.....$1.10
(Effective Aug. 29, 1938)
Flour Bluff.....$1.40
Pettus.....1.42

Jan. 28, Magnolia met Humble in Darst Creek; posted $1.00 in Luling; $1.12 in Lyttou Springs; $1.27 for Cleveland, and $1.15 in Hardin, both in Liberty county, Tex. Effective July 11, 1938, Sun Oil Co. posted $1.15 for Hardin.

Jan. 28, 1937, The Texas Co. met Humble in Darst Creek.

Anahuac, Cedar Point, Dickinson, Gillock, Fairbanks, and Turtlebay
(Effective Aug. 29, 1938)

27-27.9.....	$1.10	39-39.9.....	$1.34
28-28.9.....	1.12	40-40.9.....	1.36
29-29.9.....	1.14	41-41.9.....	1.38
30-30.9.....	1.16	42-42.9.....	1.40
31-31.9.....	1.18	43-43.9.....	1.42
32-32.9.....	1.20	44-44.9.....	1.44
33-33.9.....	1.22	45-45.9.....	1.46
34-34.9.....	1.24	46-46.9.....	1.48
35-35.9.....	1.26	47-47.9.....	1.50
36-36.9.....	1.28	48-48.9.....	1.52
37-37.9.....	1.30	49-49.9.....	1.54
38-38.9.....	1.32	50 & above.....	1.56

Conro ,Raccoon Bend (Deep sand crude) Tomball and Salsuma
(Effective Aug. 29, 1938)

28-28.9.....	$1.20	37-37.9.....	$1.38
29-29.9.....	1.22	38-38.9.....	1.40
30-30.9.....	1.24	39-39.9.....	1.42
31-31.9.....	1.26	40-40.9.....	1.44
32-32.9.....	1.28	41-41.9.....	1.46
33-33.9.....	1.30	42-42.9.....	1.48
34-34.9.....	1.32	43-43.9.....	1.50
35-35.9.....	1.34	44-44.9.....	1.52
36-36.9.....	1.36	45 & above.....	1.54

Jefferson County, Tex.

West Beaumont, see prices under Magnolia in center column.

(Continued on next page)

CRUDE OIL MARKETS

(*Continued from preceding page*)

South-Southwest Texas (cont'd)

Posted by Humble

***Mirando**

(Effective Aug. 29, 1938)

20-20.9	$0.96	36-36.9	$1.28
21-21.9	0.98	37-37.9	1.30
22-22.9	1.00	38-38.9	1.32
23-23.9	1.02	39-39.9	1.34
24-24.9	1.04	40-40.9	1.36
25-25.9	1.06	41-41.9	1.38
26-26.9	1.08	42-42.9	1.40
27-27.9	1.10	43-43.9	1.42
28-28.9	1.12	44-44.9	1.44
29-29.9	1.14	45-45.9	1.46
30-30.9	1.16	46-46.9	1.48
31-31.9	1.18	47-47.9	1.50
32-32.9	1.20	48-48.9	1.52
33-33.9	1.22	49-49.9	1.54
34-34.9	1.24	50 & above	1.56
35-35.9	1.26		

*Includes Duval, Jim Hogg, Jim Wells, Webb and Zapata counties, Tex. and Heyser and Placedo crudes.

July 6, 1937, Texas Co. posted for Duval-Mirando, $0.96 for below 21, plus 2c differential, to $1.12 for 28 & above.

LOUISIANA-ARKANSAS

Posted by Standard Oil Co. of Louisiana

(Effective Jan. 28, 1937)

	*N. La.-Ark.	Rodessa, La.	Roanoke & N. Crowley, S. La. (Dec. 28, '37)	†Columbia County, Ark. (July 7, 1938)
Below 21°..	$0.90	$0.93	$0.90	$0.83
21-21.9....	for	for	.93	for
22-22.9....	oil	oil	.96	oil
23-23.9....	Below	Below	.99	Below
24-24.9....	25°	25°	1.02	25°
25-25.9....	$0.92	$0.95	1.05	$0.85
26-26.9....	.94	.97	1.08	.87
27-27.9...	.96	.99	1.10	.89
28-28.9....	.98	1.01	1.12	.91
29-29.9....	1.00	1.03	1.14	.93
30-30.9....	1.02	1.05	1.16	.95
31-31.9....	1.04	1.07	1.18	.97
32-32.9....	1.06	1.09	1.20	.99
33-33.9....	1.08	1.11	1.22	1.01
34-34.9....	1.10	1.13	1.24	1.03
35-35.9....	1.12	1.15	1.26	1.05
36-36.9....	1.14	1.17	1.28	1.07
37-37.9....	1.16	1.19	1.30	1.09
38-38.9....	1.18	1.21	1.32	1.11
39-39.9....	1.20	1.23	1.34	1.13
40 & above	1.22	1.25	1.36	1.15

(Effective Sept. 15, 1938)

Smackover, Ark. $0.75

Urania, La. (Ark. Fuel Oil Co., Jan. 28 '37). $1.02

*Includes Caddo, Homer, Haynesville, Sabine, De Soto, Sarepta, Carterville, El Dorado, Bunkie and Miller county.

†Includes Buckner, Magnolia, and Village pools.

(Posted by Continental Oil Co.)

*Tepetate, *Abbeville and *Ville Platte, La. $1.24

*Tepetate effective Jan. 28, 1937; Abbeville and Ville Platte, June 1, 1938.

Jan. 28, 1937, Magnolia posted in Pine Island, Haynesville, Bull Bayou and Cotton Valley, La., Eldorado and Rainbow districts, Ark. same price and gravity schedule as S. O. La. posts in N. La.-Ark. fields; and met S. O. La's. Rodessa and Smackover prices.

Jan. 28, The Texas Co. met S. O. La. in N. La., except that its gravity schedule begins with below 27 at $0.94. It posted $1.37 for Garden Island, La., $1.24 for LaFitte, La. It posts $0.75 for Smackover, effective Sept. 16, 1938.

*GULF COASTAL FIELDS

Posted by Humble Oil & Refining Co. and The Texas Co.

	(Effective Jan. 28, 1937 Humble	Texas	†Refugio Saxet, etc. (Humble) (Aug. 29,'38)
Below 18..	$0.95	°$0.95	....
18-18.9....	for	for	....
19-19.9....	below	below	....
20-20.9....	21°	21°	$1.01
21-21.9....	0.98	0.98	1.03
22-22.9....	1.01	1.01	1.05
23-23.9....	1.04	1.04	1.07
24-24.9....	1.07	1.07	1.09
25-25.9....	1.10	1.10	1.11
26-26.9....	1.13	1.13	1.13
27-27.9....	1.15	1.15	1.15
28-28.9....	1.17	1.17	1 17
29-29.9....	1.19	1.19	1.19
30-30.9....	1.21	1.21	1.21
31-31.9....	1.23	1.23	1.23
32-32.9....	1.25	1.25	1.25
33-33.9....	1.27	1.27	1.27
34-34.9....	1.29	1.29	1.29
35-35.9....	1.31	for	1.31
36-36.9....	1.33	oil	1.33
37-37.9....	1.35	34°	1.35
38-38.9....	1.37	and	1.37
39-39.9....	1.39	above.	1.39
40-40.9....	1.41	....	1.41
41-41.9....	for	....	1.43
42-42.9....	oil	....	1.45
43-43.9....	40°	....	1.47
44-44.9....	and	....	1.49
45-45.9....	above.	....	1.51
46-46.9....	....	....	1.53
47-47.9....	....	....	1.55
48-48.9....	....	....	1.57
49-49.9....	....	....	1.59
50 & above.	....	....	1.61

†Includes also Greta, O'Connor-McFadden, Taft, Plymouth and Tom O'Connor crudes.

*Humble's prices apply in these Texas fields: Amelia, Barbers Hill, Clear Lake (beginning Aug. 29, 1938), Clinton, Goose Creek, Hull, Liberty, Mykawa, Orange, Pierce Junction, Raccoon Bend, (shallow sand), Sugarland, Thompsons, Webster, (beginning Aug. 29, 1938), and West Columbia. Same prices also apply, effective Feb. 1, 1938, in Clinton, Tex., posted by Stanolind.

Jan. 28, Sinclair-Prairie met above Humble schedule in full.

‡$0.95 for oil below 21° posted April 1, 1938.

July 6, 1937, The Texas Co. posted for Refugio, which includes Greta, Saxet and Taft: $1.01 for below 21, plus 2c differential, to $1.17 for 28 & above.

Texas Co. postings in Gulf Coastal Texas include: Arriola, Five Corners, Ganado, Humble, Liberty, Magnet, Manvel, Markham, Mauritz, McFaddin, Pickett Ridge, Port Neches, Sour Lake, West Columbia and Withers. In Gulf Coastal Louisiana: Bay St. Elaine, Caillou Island, Dog Lake, Four Isle, Gillis, Horseshoe Bayou, Iberia, Lake Barre, Lake Pelto, Leesville and Port Barre.

ROCKY MOUNTAIN FIELDS

Posted by Stanolind Oil & Gas Co.

(Effective Jan. 28, 1937)

Salt Creek, (except Tensleep crude), Midway and Dutton Creek, Wyo., same schedule as Stanolind posts in Oklahoma, Kansas which see under Mid-Continent crude on previous page.

(Effective Jan. 6, 1938)

Tensleep, Salt Creek field $0.70

(Effective Jan. 28, 1937)

Greybull-Torchlight $1.30
Iles, light, Col 1.18
Iles, heavy 1.12
Hogback, N. M. 1.33
Big Muddy 1.23

(Effective July 8, 1938)

Elk Basin, light $1.05
Grass Creek, light 1.05

(Effective May 1, 1938)

Frannie light $0.65
Grass Creek, heavy 0.50
Hamilton Dome, Wyo. 0.45

(Effective Nov. 4, 1936)

Frannie heavy $0.62

Posted by Ohio Oil Co.

(Effective July 8, 1938)

Elk Basin, Wyo. $1.05
Grass Creek, light 1.05

(Effective Jan. 28, 1937)

Rock Creek 1 205
Lance Creek 0.97

(Effective May 1, 1938)

Grass Creek heavy $0.50

(Effective Nov. 16, 1937)

Sunburst, Mont. $0.90

Posted by Continental Oil Co.

(Effective Jan. 1, 1938)

Cat Creek, Mont. $1.30

(Effective Jan. 28, 1937)

Big Muddy, Wyo. $1.18
Lance Creek, Wyo. 0.97

CALIFORNIA, *Posted by Standard Oil of California*

All gravities above those quoted take highest price offered in the field. Prices effective Feb. 26, 1936, except Huntington Beach, Playa del Rey, Santa Fe Springs, Kern Front, Signal Hill (Long Beach) effective March 7, 1936; Elk Hills effective June 22, 1936; Lakeview Area, Aug. 19, 1936; El Segundo and Wilmington, Oct. 15, 1937; Greeley-Canal, July 9, 1938; Santa Maria Valley, by Union Oil, May 20, 1938.

Gravity	Signal Hill (Long Beach) El Segundo †Wilmington	Seal Beach	Alamitos Heights	Huntington Beach	Inglewood	Playa del Rey	Olinda Brea Canon	Athens Rosecrans	Dominguez	Torrance	Richfield	Whittier East Coyote (La Habra)	Montebello	West Coyote Hills	Santa Fe Springs	‡Newhall and others	Mountain View	Elk Hills	Buena Vista Hills Midway-Sunset Lakeview Area	Greeley-Canal (Kern County)	Lost Hills	Coalinga	Wheeler Ridge	Santa Maria (Union Oil)
13-13.9	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	$0.40
14-14.9	$0.80	$0.79	$0.74	$0.78	$0.79	$0.80	$0.76	....	....	$0.80	$0.76	$0.76	$0.77	$0.78	....	$0.70	....	$0.70	$0.70	....	$0 70	$0.70	....	.42
15-15.9	.80	.79	.74	.78	.79	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	....	.70	.70	....	70	.70	....	.44
16-16.9	.80	.79	.74	.78	.79	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	....	.70	.70	....	.70	.70	....	.45
17-17.9	.80	.79	.74	.78	.81	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	....	.70	.70	....	.70	.70	....	.46
18-18.9	.80	.79	.74	.78	.84	.80	.78	....	....	.82	.76	.76	.77	.78	....	.70	....	.70	.70	....	.70	.70	....	.47
19-19.9	.82	.79	.74	.82	.87	.84	.81	....	....	.85	.76	.78	.77	.78	....	.70	.70	.74	.74	....	.74	.71	.70	.48
20-20.9	.85	.79	.74	.85	.90	.88	.84	....	....	.88	.78	.82	.77	.80	....	....	.70	.78	.78	....	.78	.72	.70	....
21-21.9	.88	.79	.74	.89	.93	.93	.88	....	....	.91	.80	.85	.77	.84	.78	....	.73	.82	.82	....	.82	.74	.70	....
22-22.9	.92	.82	.74	.92	.96	.98	.92	....	....	.93	.84	.89	.79	.88	.78	....	.77	.87	.87	....	.86	.78	.72	....
23-23.9	.95	.86	.77	.96	.99	1.02	.96	.84	.79	.96	.88	.93	.82	.92	.78	....	.80	.92	.92	....	.90	.82	.76	....
24-24.9	.99	.91	.80	1.00	1.02	1.06	.99	.88	.81	.99	.91	.96	.85	.96	.82	....	.84	.97	.97	....	.94	.86	.79	....
25-25.9	1.03	.95	.82	1.03	1.05	1.11	1.03	.93	.83	1.02	.95	....	.89	.99	.86	....	.88	1.01	1.01	....	.98	.90	.83	....
26-26.9	1.06	1.00	.85	1.07	1.09	1.16	1.06	.98	.86	1.05	.98	....	.92	1.03	.90	....	.91	1.06	1.06	....	1.02	....	....	....
27-27.9	1.10	1.05	.88	1.11	1.12	....	1.10	1.03	.88	....	1.02	....	.96	1.06	.95	....	.95	1.10	1.10	$0.91	1.06	....	....	....
28-28.9	1.14	1.10	.90	1.14	1.15	....	1.14	1.07	.90	....	1.06	....	.99	1.10	.99	....	.99	1.15	1.15	.94	1.10	....	....	....
29-29.9	1.17	1.15	.93	1.18	1.18	....	1.17	1.12	.93	....	1.09	....	1.03	1.14	1.03	....	1.02	1.20	1.20	.98	1.14	....	....	....
30-30.9	1.21	1.19	.95	1.22	1.21	....	1.21	1.17	.95	....	....	....	1.07	1.17	1.08	....	1.06	1.25	1.25	1.02	1.18	....	....	....
31-31.9					1.24		1.24	1.22	.97	....	....	....	1.11	1.21	1.12	....	1.09	1.29	1.29	1.06				....
32-32.9		*Elwood Terrace		....	1.27		1.27	1.27	1.00	....	....	....	1.14	1.25	1.16	....	1.13	1.34	1.34	1.09	Kettleman Hills			....
33-33.9	....	1.28	....	....	....		....	1.32	....	....	....	....	1.18	1.28	1.20	....	1.17	1.38	1.38	1.13	....	1.19	....	....
34-34.9	....	1.32	....	....	....		....	1.37	....	....	....	....	1.22	1.32	1.25	....	1.20	....	....	1.17	....	1.23	....	....
35-35.9	....	1.35	....	....	....		....	1.42	....	....	....	....	1.25	....	1.29	....	....	....	....	1.20	....	1.27	....	....
36-36.9	....	1.39	....	....	....		....	1.46	....	....	....	....	1.29	....	1.33	....	....	....	....	1.24	....	1.31	....	....
37-37.9	....	1.43	....	....	....		....	1.51	....	....	....	....	1.32	....	1.37	....	....	....	....	1.28	....	1.35	....	....
38-38.9	....	....	....	....	....		....	1.56	....	....	....	....	1.36	....	1.42	....	....	....	....	1.31	....	1.39	....	....
39-39.9	....	....	....	....	....		....	1.61	....	....	....	....	1.40	....	....	....	....	....	....	1.35	....	1.43	....	....
40-40.9	....	....	....	....	....	F. O. B. Standard Pipe Line	....	1.66	....	....	....	....	1.43	....	....	....	....	....	....	1.39	....	....	....	....
41-41.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.43	....	....	....	....
42-42.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.46	....	....	....	....
43-43.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.50	....	....	....	....
44-44.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.54	....	....	....	....
45-45.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.57	....	....	....	....
46-46.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.61	....	....	....	....
47-47.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.65	....	....	....	....
48-48.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.68	....	....	....	....

*F. o. b. ship.

‡Also McKittrick, Kern River. Kern Front and Round Mountain $0.70 thru 19.9 gravity; no higher gravity quoted.

†Wilmington prices differ on gravities below 18.9. Prices are: 14-16.9, $0.75; 17-17.9, $0.77; and 18-18.9, $0.79; rest of schedule same as Signal Hill.

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Coming Meetings

Liquefied Petroleum Gas Assn., Southern Section, Hotel Marion, Little Rock, Ark., Sept. 26, 27.

Western Petroleum Refiners Assn., Technical Group Meeting, Allis Hotel, Wichita, Kan., Sept. 29.

National Association of Petroleum Retailers, annual meeting, St. Louis, Sept. 27, 28 and 29.

American Assn. of Petroleum Geologists, mid-year meeting, under direction of West Texas Geological Society, El Paso, Tex., Sept. 27-Oct. 2.

National Assn. of Credit Men, Southwest Credit Conference, San Antonio, Tex., some time in Oct.

National Lubricating Grease Institute, 6th annual meeting, Chicago, Oct. 3 and 4.

Liquefied Petroleum Gas Assn., Pacific Section, Hotel St. Francis, San Francisco, Oct. 4.

Ohio Petroleum Marketers Assn., fall conference and golf tournament, Ohio Hotel and Southern Hills Country Club, Youngstown, O., Oct. 5, 6.

American Institute of Mining and Metallurgical Engineers, Petroleum Division, Plaza Hotel, San Antonio, Tex., Oct. 5-7.

New England States Tax Officials Assn., 26th annual conference, Bangor, Me., Oct. 6, 7.

Society of Automotive Engineers, national regional fuels and lubricants meeting, Tulsa, Okla., Oct. 6 and 7.

Liquefied Petroleum Gas Assn., Eastern Section, Atlantic City, N. J., 1 day week of Oct. 10.

Montana National Bituminous Conference, sponsored by Western Petr. Refiners Assn. and Mont. and Miss. highway departments, Edgewater Gulf Hotel, Biloxi, Miss., Oct. 10 to 13.

American Gas Assn., Atlantic City, N. J., Oct. 10 to 14.

National Safety Congress, Petroleum Section, Hotel Stevens, Chicago, Ill., Oct. 10 to 14.

North American Gasoline Tax Conference, Tulsa, Oct. 10 to 14.

Indiana Independent Petroleum Assn., Fall convention, Hotel Severin, Indianapolis, Ind., Oct. 12 and 13.

National Stripper Well Assn., and Oklahoma Stripper Well Assn., annual meetings, Tulsa, Okla., Oct. 18.

Independent Petroleum Assn. of America, Tulsa, Okla., Oct. 19, 20 and 21.

American Inst. of Mining & Metallurgical Engineers, Petroleum Division, Los Angeles, Oct. 20, 21.

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Telephone Bigelow 3-4020

Situation Open

Company who has been selling nationally through the jobber has changed its selling policy and will now sell to the dealer trade direct, requires additional salesmen. Replying give age, education, present employer, sales experience, territory preferred.

Box 39

For Sale

GASOLINE HOSE
10' lengths clean cotton jacketed gasoline hose with couplings attached:
1¼"—$3.10 per length
1" —$2.75 per length
¾"—$2.25 per length
F O B delivered.
United Tank and Installation Co.,
29 Line St., Cambridge, Mass.

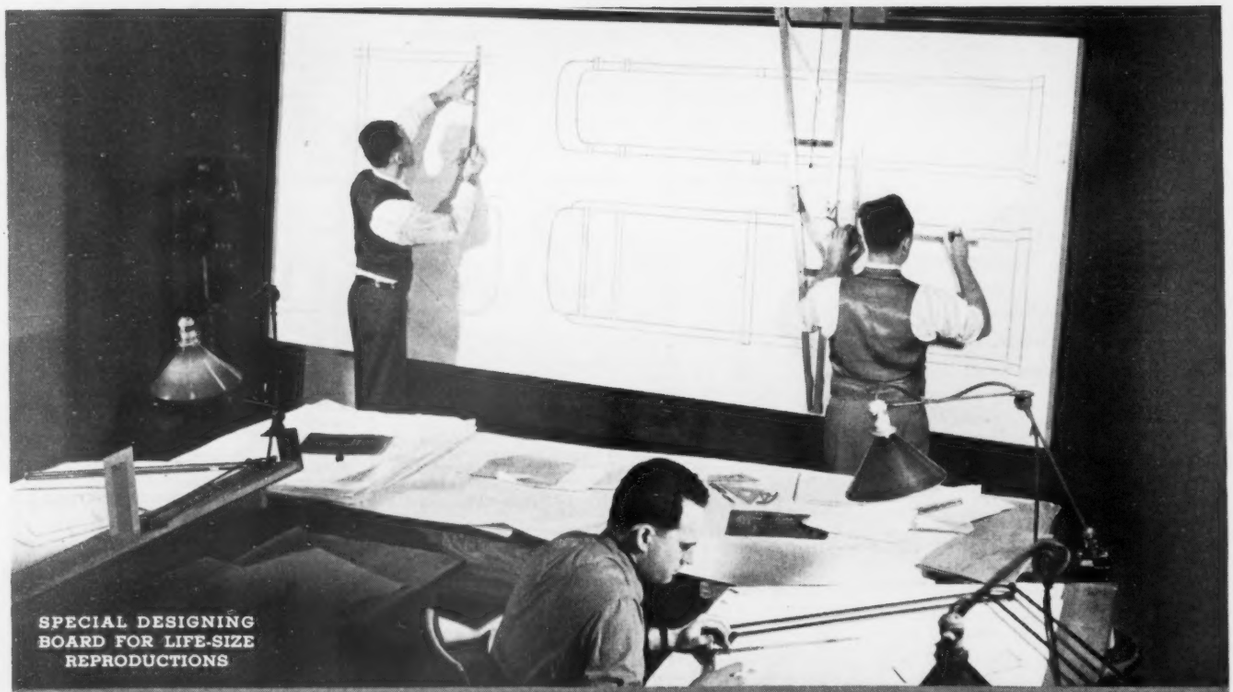
For Sale—Several Million tons of
FULLERS EARTH
Report of refinery test runs available. Deposit located in Michigan on Railroad.
Chas. W. Hopkinson
17216 Edgewater Drive, Lakewood, O.

WHOLESALE BULK PLANT AND SERVICE STATION on main highway, Willimantic, Conn. Completely equipped, 100,000 storage and railroad siding. Address Box 46, care of National Petroleum News.

FOR SALE—one Burpee 5-quart and one Burpee 1-quart hand operated can sealer. Cost $75 and $15. Make me an offer. W. L. Eastman, 3051 Essex Rd., Cleveland Heights, Ohio.

FOR SALE
Three (3) piece truck-train powered with 5 ton Autocar Tractor, Fruehauf Semi with three (3) compartment aluminum tank, 3042 gallon capacity, Fruehauf Trailer with three (3) compartment aluminum tank, 2514 gallon capacity; Tractor weight 10,770 lbs., Semi weight 9,520 lbs., Trailer weight 10,910 lbs. Over-all length of train 53 feet 11 inches.
United Oil Manufacturing Co.,
Erie, Pa.

GREAT PUMPS DEMAND



SPECIAL DESIGNING BOARD FOR LIFE-SIZE REPRODUCTIONS

THE BREAK-DOWN TEST BY WHICH FLAWS ARE PREVENTED

Engineering research and experiment never cease at the modern Tokheim factory. Engineers are leaders in their field — facilities are the finest to be had. For Tokheim knows that a gasoline pump can be no better than its engineering — that Great Pumps demand great engineering. Engineering has made Tokheim Pumps famous for 37 years.

The oil industry has written its own record of satisfaction with Paraflow Pour Depressant for paraffin base oils. The industry has treated more than a billion gallons of oil with Paraflow Pour Depressant. That is more than enough—if all the oils had been automotive—to supply twenty crankcase fillings to each of the 29,705,222 automotive vehicles now in the United States. Paraflow Pour Depressant is used by over 90% of the refiners and compounders of paraffin base oils.

PARAFLOW SALES DIVISION
STANDARD OIL DEVELOPMENT CO.
26 BROADWAY, NEW YORK, N. Y.

N. H. Weber

N. H. Weber, re-elected first vice president of the National Petroleum Association at its recent annual convention, started in the oil business as a balance credit clerk at Oil City in 1899, with a company later affiliated with the Pure Oil Co. His connection with Pure has been maintained throughout and he was elected a vice-president of the company in 1917. He has been a vice president of the National Petroleum Association for about five years.